

Terugblik 1e en 2e dag van de Perceptie

In 2006 werd de anderhalf jaarlijkse 'traditie' geboren om wetenschappers uit Nederland en Vlaanderen op het gebied van perceptie bijeen te brengen. Het doel is om over de grenzen van de individuele onderzoeksdisciplines heen, informatie uit te wisselen en inspiratie op te doen. De opkomst was beide keren groot (ca 100 man) en feedback en evaluaties ronduit positief, met name over de laagdrempeligheid, goede sfeer en brede opzet.

Eerder programma's, abstracts en lijst van deelnemers zijn hier te downloaden:

13 oktober 2006:	programma 2006	abstracts 2006	deelnemers 2006
20 juni 2008:	programma 2008	abstracts 2008	deelnemers 2008

Eerste Dag van de Perceptie (1e en 2e foto), vrijdag 13 oktober 2006, voorgezeten door Frans Verstraten, Hoogleraar Psychonomie aan de Universiteit Utrecht. Parallele sessies zijn nodig om het geheel te accommoderen.

Tweede Dag van de Perceptie (3e en 4e foto), vrijdag 20 juni 2008, voorgezeten door Prof. John van Opstal, Universiteit Nijmegen. Tijdens posters en demo's vindt ditmaal ook een 'Perceptie Olympiade' plaats, een serie waarnemingsprestatie testjes.



Programma 2006

Het programma van de Dag van de Perceptie 13 oktober 2006 is te downloaden als [pdf](#) en was als volgt opgebouwd:

- 09:00 Ontvangst met koffie
- 09.30 Welkomstwoord door het organisatiecomité
Introductie door de dagvoorzitter: Frans Verstraten, hoogleraar Cogn. en Theor. psych. (UU)
- 09:40 plenaire sessie 1
- 11:00 koffie break, ophangen posters
- 11:30 parallele sessies:
 - sessie 2: visueel
 - sessie 3: auditief, multimodaal, visueel en toegepast
- 12:30 lunch met posters en demo's
- 14:00 parallele sessies:
 - sessie 4: visueel
 - sessie 5: haptisch, multimodaal, visueel en toegepast
- 15:30 koffie en poster break
- 16:00 plenaire sessie 6
- 17.00 afsluiting en borrel

Plenaire presentaties duren 20 minuten per spreker (inclusief 4 minuten discussie).
Parallele presentaties duren 15 minuten per spreker (inclusief 3 minuten discussie).
Het staat de spreker vrij het verhaal in Nederlands of Engels te houden.

sessie 1 (plenair)

Interactions between speed and contrast tuning in area MT

Richard van Wezel, Bart Krekelberg and Tom Albright

A car driving through the fog appears to move more slowly than one driving on a clear and sunny day. In the laboratory, this observation has been confirmed as a pronounced reduction of perceived speed caused by a reduction in contrast. We measured the influence of contrast on cells in the middle temporal area of the macaque (MT), which have been hypothesized to underlie the perception of speed. The influence of contrast on the responsiveness and speed tuning of these cells was pervasive and highly regular. As expected, most cells responded less at low contrast. More importantly, the preferred speed of most cells shifted to lower speeds at lower contrasts. Moreover, about one third of cells surprisingly responded more strongly to slow low contrast stimuli than to slow high contrast stimuli. Current models of speed perception suggest that each MT cell votes for its preferred speed with a vote determined by its firing rate. We tested a number of these labeled-line models by entering the neural responses we recorded from MT and comparing the models' predictions with the perceptual reports of human and monkey subjects. Contrary to the perceptual reports, the labeled-line models predicted that perceived speed should increase when contrast is decreased. We therefore conclude that perceived speed is not based on a labeled-line interpretation of MT cells.

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sessie 1 (plenair)

Sound Recognition in arbitrary acoustic environments

Tjeerd Andringa

The application of auditory models that preserve continuity through time and frequency to estimate the physical development of sound sources seems fruitful. A number of successful and robust applications developed at the University of Groningen and the company Sound Intelligence, indicate this approach can be used to build recognition systems that are, just as the natural perceptible system, able to work in complex, uncontrollable, and unconstrained real-world environments. Currently, these applications can reliably detect vehicle sounds and verbal aggression in complex social settings (such as train station, city centers, etc.) and indications are that this range can be extended to encompass arbitrary sound classes in arbitrary acoustic environments.

The basis of this technology is the assumption that perception involves the estimation of physical properties from the signal through a process in which each gradual development through time and frequency is interpreted as a contribution of a physical event in the environment by matching the development with im- and explicit knowledge about (past) events. This talk will give an overview of a number of the 7 PhD-projects that are currently in progress at the University of Groningen and that all contribute to the further development of framework described above.

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sessie 1 (plenair)

Perceiving emotions through psychophysiological signals

Egon L. van den Broek, Marleen H. Schut, Joyce H.D.M. Westerink, Kees Tuinenbreijer, and Jan van Herk

Emotions influence our cognitive functioning heavily. Therefore, it is interesting to develop measurement techniques that can record experienced emotions. Moreover, to improve user system interaction, computers need to recognize and respond properly to their user's emotional state. This would enable affective computing, which relates to, arises from, or deliberately influences emotion. A range of experiments will be discussed in which a range of psychophysiological measures are applied to penetrate human emotion space. Hereby, we distinguish three facets: the obtrusiveness and noise sensitivity of the measures and the ecological validity of the research. Several statistical parameters were derived from physiological measurements of three electromyography signals: frontalis (EMG1), corrugator supercilii (EMG2), and zygomaticus major (EMG3). In one experiment, 24 participants were asked to watch film scenes of 120 seconds, which they rated afterward. These ratings enabled us to distinguish four categories of emotions: negative, positive, mixed, and neutral. Using the EMG2 and EMG3, discrimination between the four emotion categories was possible. In two other experiments, the 26 participants were asked to read out a story and to relive a recent anxious experience and speak about it. The latter enabled us to determine the amount of experienced arousal. In addition to the three experiments, experiences with galvanic skin conductance and heart rate variability will be discussed. In all instances, real time processing of the signals proved to be possible. This enables tailored user system interaction, facilitated by an emotional awareness of systems. Such systems could, for example, be applied to increase the immersion of participants in games, in ambient intelligence settings incorporating a Personalized Empathic Computing (PEC), or in telepsychiatry settings. Such systems would introduce a new era in user system interaction.

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sessie 1 (plenair)

Shining a light on materials: Physics-based human and computer vision of materials and light fields

Sylvia C. Pont

Our research focuses on human and computer vision of the reflectances and textures of natural rough materials and of natural complex light fields. The appearance of objects in scenes is determined by their shape, material properties and by the light field, and, in contradistinction, the appearance of those objects provides us with cues about the shape, material properties and light field. The latter so-called inverse problem is underdetermined and therefore suffers from interesting ambiguities. I will discuss the state of the art in this field, visually illustrate the main problems and some interesting ambiguities, and I will provide an overview of research results. Textures of illuminated rough materials are strongly dependent on the illumination and viewing directions. Luminance histogram-based measures such as the average luminance, its variance, the shadow mode, and the contrast provide robust estimates with regard to the surface structure and the light field. The most simple models can describe these effects optically and explain how such cues are related to the shading, texture contrast, surface relief and the illumination properties. Recent studies show that human observers' performance agrees well with predictions on the basis of these measures. If we also take into account the spatial structure of the texture it is possible to estimate the illumination orientation

locally. These estimates are subject to the bas-relief and the convex-concave ambiguities. We have shown that image analysis on the basis of second order statistics and human observers' estimates correspond well. Currently we are studying illuminance flow: the ensemble of local illumination orientation estimates on rough 3D objects, which form systematic robust patterns. The illuminance flow provides estimates of the tangential components of the local light vectors, additionally to the estimates of the normal components, which are provided by the shading of the object. The illuminance flow is an important entity for shape from shading and for light field estimates. In several studies we tested how well human observers are able to match and discriminate simple light field properties from object appearance and in scenes. Such simple properties are for instance the average illumination direction and the diffuseness of the illumination. We found that observers make systematic errors, which depend on material properties, object shapes and position in the scene. Moreover, our results show that perception of material and illumination are basically confounded and, interestingly, adding complex natural illumination containing higher order angular frequencies helps to disambiguate this confusion in material judgments, but not in illumination judgments.
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sessie 2 (parallel met sessie 3)

fMRI of relational color constancy in human visual cortex

Frans W. Cornelissen, Just van Es, Tony Vladusich

Human subjects judge colors relatively independently of the illumination, a phenomenon called color constancy. Psychophysical studies indicate that color constancy is a multifaceted phenomenon with many contributing processes. Here we examine the nature of cortical computations underlying one of these contributions, called relational color constancy - the judgement of relationships between colors in a scene across an illuminant change - using functional magnetic resonance imaging (fMRI). We observed nearly identical activation patterns in the conventional color-sensitive areas of human visual cortex across tasks requiring use of either relational or local color information. Minor differences in color-sensitive activations were primarily associated with shifts in attention. Relational color judgments were, however, selectively associated with focal activations in parietal and frontal brain regions. Our results indicate that the computations underlying relational color constancy require recruitment of brain regions associated with estimation of numerical magnitude and attentional allocation, rather than only the traditional color-sensitive areas. This work was supported by grant 051.02.080 of the Cognition program of the Netherlands Organization for Scientific Research (NWO).
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sessie 2 (parallel met sessie 3)

The Brain Knows the Oblique Effect

Tobias Borra, Ignace T.C. Hooge and Frans A.J. Verstraten

Vertical and horizontal orientations are perceived more precisely than oblique orientations (the oblique effect). Visual perception of object orientation is thought to be mediated by salient axes of symmetry and elongation (Boutsen & Marendaz, 2001). We expect that in objects with multiple principal axes, observers will select the axis affording the best orientation discrimination. This will result in lower JNDs in object orientation when one or more of the principal axes are either vertical or horizontal, compared to principal axes that are oblique. We designed three experiments, using dot-stimuli to prevent interference of local and global contours: a two-dot 'line' stimulus, a three-dot 'triangle' stimulus and a four-dot 'square' stimulus, with one, three and four principal axes, respectively. Observers were presented with two temporally separated stimulus orientations and were instructed to judge the orientation of the second stimulus compared to the first. We measured JNDs for various object orientations using interleaved staircases. The results suggest that observers use different object axes, depending on the axial orientation. This results in the predicted lower JNDs for the oblique stimulus orientations where the principal axis is vertical or horizontal. We conclude that observers are capable of selecting the most informative axes when judging visual object orientations.
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sessie 2 (parallel met sessie 3)

Objects popping out of schemas: Putting object perception back in context

Peter De Graef and Karl Verfaillie

Data-driven, feedforward image processing is powerful enough to recognize isolated objects from even a single glance and at great eccentricities. But does this constitute an adequate description of everyday object perception in scenes? What about the claim that semantically anomalous objects attract attention, and is it really easier to recognize an object when it appears in a plausible context than when it is presented in an implausible setting? I will report data from various eye-tracking paradigms (non-object search task, speeded object verification, transsaccadic object perception, and attentional cuing) to argue that object identification is indeed facilitated in a semantically congruent scene and that this is at least partly due to the contextual enhancement of extrafoveal, presaccadic object processing.
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sessie 2 (parallel met sessie 3)

Disengaging attention sets the temporal limit of attentive tracking.

J.S. Benjamins, I.T.C. Hooge, M.J. van der Smagt, F.A.J. Verstraten

At first sight, recent studies investigating the temporal limits of attentive tracking show contradictory outcomes. Attentively tracking an object in an ambiguous apparent motion display can have an upper limit of around 0.4 revolutions per second (rps; Horowitz et al., 2004) or 1 rps (Verstraten et al., 2000). Here, we demonstrate that this difference depends on presentation conditions: an important determinant of temporal attentive tracking limits appears to be the duty cycle. Only when the duty cycle is below 50%, tracking is possible at the high(er) rates, while at the low rate duty cycle has little effect. We conclude that attention needs an offset signal before an onset signal to be able to disengage and shift to other locations at higher revolution rates. This time to disengage determines the temporal limit of attentive tracking.
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sessie 3 (parallel met sessie 2)

Functional assessment of the effect of neurotrophic treatment of deafened guinea pigs

M.J.H. Agterberg, H. Versnel, J.C.M.J. de Groot, S.F. Klis, G.F. Smoorenburg and F.W.J. Albers

Dept. of Otorhinolaryngology, University Medical Center Utrecht and Rudolf Magnus Institute of Neuroscience, The Netherlands. Several studies indicate that application of neurotrophic factors can enhance spiral ganglion cell (SGC) survival and reduce electrically evoked auditory brainstem responses (eABRs) in deafened animals. We are interested in SGC survival in animals which have been deaf for a clinically relevant period. We used a period of two weeks after which in deafened guinea pigs a significant SGC loss is observed. Structure and function of SGCs were investigated in deafened guinea pigs treated with brain-derived neurotrophic factor (BDNF).

In the control group, guinea pigs were implanted with a round-window electrode and deafened by co-administration of kanamycin and furosemide. In the treated groups, 2 weeks after the deafening procedure, the right cochleas were implanted with an electrode and cannula. In the BDNF-treated group the cannula was attached to a mini-osmotic pump (flow rate: 0.25 µl/h) filled with BDNF (100 µg/ml). BDNF was administered to the cochlea for 4 weeks. In all animals, compound action potentials (CAPs), auditory brainstem responses (ABRs) and eABRs were recorded regularly in the experiment. Acoustical stimuli were broadband clicks and tone pips of various frequencies (2-16 kHz). The electrical monopole stimulus currents were 50-250 µA, pulse width was 20 µs. At the end of the experiment animals were sacrificed for histology.

In the control group, SGC densities started to decrease significantly between 2 and 4 weeks and reached a 70% loss, 8 weeks after deafening. We found a significant effect of BDNF treatment: SGC densities in BDNF-treated (right) cochleas were 2 to 3 times higher than in untreated (left) cochleas. We will relate the SGC densities found in the BDNF-treated animals to functional data as obtained with CAPs, ABRs and eABRs.

This work was funded by the Heinsius-Houbolt Foundation, The Netherlands.

sessie 3 (parallel met sessie 2)

Segregation of concurrent sounds by temporal envelope and binaural cues

Othmar Schimmel, Steven van de Par, Armin Kohlrausch, and Jeroen Breebaart

In this contribution, we investigated the ability of listeners to segregate two concurrent signals with the same spectral but with a different temporal envelope structure, based on differences in lateralization cues. The two signals were a harmonic tone complex with a 20-Hz fundamental and band-pass noise. In a 3AFC paradigm, the reference intervals had binaural cues such that the band-pass noise was lateralized to the right ear and the harmonic tone complex to the left ear using identical but opposing binaural cues. In the test interval, the lateralization was reversed. Threshold interaural time and level differences for detecting the test interval were measured for various bandwidths, center frequencies, and temporal envelope structures. For the combined signals used in our experiments, long-term interaural cross correlation patterns are indistinguishable across reference and test intervals for physiologically relevant interaural differences. When listeners were able to detect the test interval, binaural interaction must have been capable of processing changes in binaural cues that occurred at a rate of 20 Hz or more, revealing the lateralization of the constituent signals. Results showed that, while segregation based on interaural level differences was already possible within a single critical band (though depending on center frequency), segregation based on interaural time differences required the signals to cover at least three contiguous critical bands. Manipulations of the temporal envelope structure of either one of the signals suggested that differences in the temporal envelopes of both signals is an important factor enabling the segregation and lateralization of spectrally and temporally overlapping signals.
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sessie 3 (parallel met sessie 2)

Bimodale zinsperceptie: de integratie van gemaskeerde visueel en auditief gepresenteerde zinnen.

A.A. Zekveld en T. Houtgast

Veel slechthorenden ervaren problemen met het verstaan van spraak, met name in aanwezigheid van achtergrondruis. Een van de mogelijkheden om het spraakverstaan te verbeteren, is het presenteren van ondersteunende visuele informatie. Binnen het EU-project HearCom wordt een prototype van een hulpmiddel voor slechthorenden ontwikkeld waarin een automatische spraakherkenner wordt geïmplementeerd. Deze spraakherkenner herkent de spraak en de resulterende tekst wordt visueel op een display gepresenteerd. Automatische spraakherkenning werkt helaas nog niet perfect; er worden herkenningfouten gemaakt en tevens kan de herkende spraak (tekst) vertraagd zijn ten opzichte van de spraak. Slechthorenden moeten dus proberen met deels onjuiste en vertraagde visuele informatie de onvolledige of verstoorde auditieve informatie aan te vullen. Daarom is eerst onderzocht in welke mate men in het algemeen in staat is om onvolledige visuele informatie (deels gemaskeerde tekst) te combineren met verstoord auditieve informatie (zinnen in achtergrondruis). De resultaten van dit onderzoek impliceren dat normaalhorenden de incomplete auditieve en visuele informatie zeer efficiënt kunnen integreren. Deze geschatte efficiëntie van de bimodale integratie neemt af wanneer rekening wordt gehouden met het aantal onafhankelijke delen in de gepresenteerde zinnen.

Daarnaast hebben we meer specifiek onderzocht wat de invloed is van bepaalde kenmerken van tekst van een automatische spraakherkenner op het profijt van deze tekst tijdens het luisteren naar spraak in ruis. Hierbij is de invloed van het aantal fouten in de herkenning, de vertraging van de herkenning en het type tekst onderzocht.

De belangrijkste conclusie van dit onderzoek is dat het profijt van de visueel gepresenteerde tekst met name afhangt van de leesbaarheid van de tekst. Het type tekst is daarbij minder van belang. Vertraging van de visuele informatie heeft een matig negatief effect op het profijt ervan tijdens het verstaan van spraak.

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sessie 3 (parallel met sessie 2)

Gevalideerde simulatie van visuele beperkingen door slechthoortendheid

Wim van Damme & Maarten Hoogervorst

Doel: De ontwikkeling van een gevalideerde computer simulatie en visualisatie van de visuele beperkingen bij slechthoortendheid. De gevalideerde simulatie kan gebruik maken van individuele optometrische meetgegevens. Methode: In experimenten met slechthoorende en normaalziende proefpersonen werd bepaald welke informatie uit een beeld kan worden verwijderd voordat het verschil met het origineel zichtbaar wordt. Resultaten: Het bleek goed mogelijk op grond van de resultaten van optometrische

testen (visus, contrastgevoeligheid, perimetrie) de simulatieparameters te voorspellen van zowel slechtzienden met verschillende visuele stoornissen als normaalzienden. Conclusies: De ontwikkelde, gevalideerde simulatie is goed bruikbaar ten behoeve van informatievoorziening naar de directe omgeving van een slechtziende patiënt en ook als hulpmiddel bij het voor slechtzienden optimaliseren van de toegankelijkheid van openbare ruimtes.
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sessie 4 (parallel met sessie 5)

Visual grouping: Temporal and spatial interactions

Frouke Hermens, Frank Scharnowski, Michael H Herzog

How features in a visual scene are grouped and combined, is still largely unknown. Here, we investigate how information is integrated over time and space. Integration over time was realized by means of a feature fusion paradigm, in which features of two briefly sequentially presented stimuli are perceived as belonging to one object. We presented a vernier (two vertical bars with a small horizontal offset) which was immediately followed by a vernier with opposite offset direction (anti-vernier). Because of the very short presentation times of vernier and anti-vernier, feature fusion occurs, which means that only one vernier is perceived with an offset that is a combination of the offsets of the vernier and the anti-vernier. Integration over space was achieved by embedding the anti-vernier either in a set of aligned verniers or anti-verniers. We found that a vernier followed by a large set of oppositely offset anti-verniers was well visible, indicating that the anti-vernier was spatially integrated into the grating. However, when the following anti-vernier was embedded in aligned verniers, its offset fused with the preceding vernier, i.e. no spatial grouping with the surrounding elements occurred. Although one might expect that this complex interaction of temporal and spatial information requires a sophisticated grouping operation in the brain, we could show with computer simulations that a simple two-layer neural network can well account for the findings, suggesting that grouping of visual information can be understood from low-level neural interactions.

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sessie 4 (parallel met sessie 5)

Wat zien kleurenblinden?

Marcel Lucassen en Johan Alferdinck

Een aangeboren stoornis in het kleurenzien komt bij ca. 8% van de mannen en ca. 0.04% bij de vrouwen voor. Alleen al in Nederland zijn dat zo'n 700.000 individuen die een verminderd vermogen hebben om kleuren van elkaar te onderscheiden. Wat deze mensen zien is van groot belang voor het kunnen begrijpen (en voorkomen) van problemen waar zij in de dagelijkse praktijk mee worden geconfronteerd. Om de belevingswereld van de kleurenblinden te bestuderen hebben we een simulator ontwikkeld waarmee je als het ware door de ogen van de kleurenblinde kunt kijken. De software toont beeldmateriaal (foto of video) in de originele kleurweergave en in een weergave die overeenkomt met een gekozen aard en gradatie van de kleurzienstoornis. Nieuw hieraan is dat we niet alleen de dichromaten (2 in plaats van 3 functionele kegelsystemen) maar ook de anormale trichomaten kunnen laten zien, en in real-time video.

We schetsen kort het principe van de simulatie, en laten zien hoe we die hebben toegepast in een onderzoek naar de eisen van het kleuronderscheidend vermogen in de praktijk.

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sessie 4 (parallel met sessie 5)

Perceiving colour at a glimpse: a bias towards changes near fixation

Eli Brenner, Jeroen J.M. Granzier, Jeroen B.J. Smeets

We used classification images to examine whether certain parts of a surface are particularly important when judging its colour, such as its centre, its edges, or where one is looking. The scene consisted of a regular pattern of square tiles with random colours from along a short line in colour space. Targets defined by a square array of brighter squares were presented for 200ms. The colour of the targets' tiles was biased by an amount that led to about 67% of responses being correct. Subjects fixated a point that fell within the target's lower left quadrant and reported each target's colour. Subjects tended to report the colour of the tiles near the fixation point. When coloured tiles were also presented before (and after) target presentation they had the opposite effect, indicating that the change in colour is critical. The influence of the tiles' colour reversed at the target's border, but the colour at the border itself was not particularly important. These findings suggest that when judging surface colours during the short 'glimpses' between saccades, temporal comparisons may be at least as important as spatial ones.

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sessie 4 (parallel met sessie 5)

Seeing brightness and darkness: more dimensions than meet the eye?

Tony Vladusich, Marcel P Lucassen and Frans W Cornelissen

Classical theories of achromatic color perception assume that bright and dark constitute the endpoints of a continuum containing all possible shades of grey. We test this assumption using visual stimuli in which both brightness and darkness are simultaneously induced into a target surface. According to classical theories, the brightness and darkness components should partially cancel and subjects should always be able to make satisfactory achromatic color matches in a comparison surface. We show that, contrary to this prediction, subjects have greater difficulty setting satisfactory matches when brightness and darkness components are simultaneously induced into a target surface than when only one or the other component is induced. Our results can be understood by assuming that all grey shades constitute points in a two-dimensional achromatic color space whose underlying dimensions correspond to brightness and darkness. This theory predicts that subjects cannot make satisfactory matches across two displays differing only in the variance of induced brightness and darkness components.

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sessie 4 (parallel met sessie 5)

Human versus artificial texture perception

Peter J. Petiet and, Egon L. van den Broek

The performances of current texture analysis algorithms are still poor, especially when applied to a large, diffuse texture domain. Most of these purely computationally driven techniques are created to function within a highly restricted domain. When applied as computer vision techniques, the results are frequently judged as not intuitive by the system's users. In the current line of research, after two smaller studies, a large study has been conducted with 450 participants with the aim to unravel human texture classification. The bare bones of texture analysis, as embedded in the human visual system, were taken as starting point. Consequently, three aspects were identified: 1) colorful texture analysis, 2) grayscale texture analysis, and 3) global color distribution. For artificial color analysis, an unique, human inspired color space segmentation was utilized. Artificial texture analysis was based on the co-occurrence matrix. In addition to color and texture, the influence of shape was taken into account. To gather information on the human texture classification process, an online card sorting experimentation platform was used: <http://eidetic.ai.ru.nl/M-HinTS/>. In separate experiments, the participants clustered color and grayscale versions of 54 textures, drawn from the OuTex and VisTex texture databases, into six clusters. Three versions of the experiments were conducted with textures printed in: squares (the 'shapeless condition'), three distinct shapes, (the 'three-shape condition'), and six predefined shapes (the 'six-shape condition'). Both color and shape did have a significant influence on the mutual agreement among the subjects, ranged from 78% (color - 'shapeless') to 60% (gray - 'six-shape condition'). Using artificial clustering techniques we mimicked human's average texture classification in 80% (color - 'shapeless') to 58% (gray - 'six-shape condition') of the cases. Hence, the artificial clustering did have a similar mutual agreement with the participants as the participants had among each others. The success of mimicking human texture classification could not mask the enormous variety among the participants in their classification task. The latter emphasized the impossibility to develop a generic texture classification system, which would resemble human texture classification. However, the results enable the design of a generic model. Subsequently, the model's parameters could be adapted to specific users, if preferred. Then, not only average human texture perception could be mimicked but also specific user characteristics could be replicated, which would be a first step in new cognitive computer vision techniques.
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sessie 4 (parallel met sessie 5)

Binocular rivalry reveals negative effects of perceptual learning

Chris L.E. Paffen, Frans A.J. Verstraten & Zoltan Vidnyanszky

Perceptual learning is usually regarded as an improved performance on a perceptual task after repeated practice or exposure to a certain stimulus. Here we show that repeated exposure to a visual stimulus can also have a negative effect: continuously ignoring a visual stimulus can weaken its strength when assessed with binocular rivalry. Binocular rivalry occurs when each eye is presented with a dissimilar image; perception will alternate between the left- and right-eye image. The time each image is perceived can be used as an index of the strength of the image. Method: Observers performed a speed discrimination task for 45 minutes, on 5 consecutive days; they indicated which of two intervals contained faster rightward motion, while ignoring downward motion, which was simultaneously presented. Before and after training, observers reported their dominant perception of pairs of rival motion stimuli with different motion directions (right vs. down, left-up vs. down, left-up vs. right). As an extra assessment of the effect of training, motion coherence thresholds for these 3 motion directions were acquired before and after training. Results: The stimulus irrelevant during training became a weaker stimulus during binocular rivalry (it was perceived for a shorter duration after training). Surprisingly, the stimulus on which the speed discrimination task was performed during training did not become a stronger stimulus during rivalry. Interestingly, the effect of training on binocular rivalry contrasted with the effect on motion coherence thresholds: the threshold for the trained motion direction decreased after training, while that of the task-irrelevant remained unaltered. Conclusions: The results show that continuously ignoring a stimulus can reduce its strength during binocular rivalry. This shows that perceptual learning can have a negative effect on the perception of a visual stimulus. We further hypothesize that the mechanisms of selecting and ignoring stimuli via attention overlap with suppressive interactions involved in binocular rivalry.
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sessie 5 (parallel met sessie 4)

Beeldkwaliteit van nachtkijkers bepaal je met de TOD methode

Wanneer men electro-optische waarnemingsapparatuur zoals camera's gebruikt, is het vaak van groot belang om te weten welke waarnemingsprestaties men daarmee in de praktijk kan verwachten. Zo wil een militair bijvoorbeeld graag weten op welke afstand hij met zijn nachtzichtapparatuur vijandige doelen kan herkennen. Bij gebruik van bewakingscamera's wil je er zeker van zijn dat directe of opgenomen beelden bruikbaar zijn voor de identificatie van personen. Met de bagagescanners op luchthavens moet men in staat zijn om bepaalde materialen te detecteren. Hoe kun je de bruikbaarheid van deze apparatuur, die vaak op zeer verschillende technieken is gebaseerd, toch op een eerlijke, objectieve manier kwantificeren?

Door TNO Defensie en Veiligheid is de TOD methode ontwikkeld: een simpele maar robuuste laboratoriumtest waarmee de kwaliteit van een beeldvormend systeem (inclusief waarnemer) kan worden vastgesteld. TOD staat voor Triangle Orientation Discrimination. Via het beeldsysteem worden testpatronen (gelijkzijdige driehoeken met 4 mogelijke oriëntaties) met oplopende moeilijkheidsgraad aan de waarnemer aangeboden, die de oriëntatie van de patronen moet vaststellen. Uit de score volgt de z.g. TOD curve die representatief is voor de kwaliteit van het beeldsysteem. De TOD kenmerkt zich o.a. door een sterke relatie met objectherkenning in de praktijk, de eenvoud die vergelijkbaar is met een ogentest, en de objectiviteit van de uitkomst. Naast de laboratoriumtest is ook een model ontwikkeld waarmee de TOD gegeven de fysische parameters van een camerasysteem kan worden voorspeld. Het model bestaat uit een sensorsimulatiemodule en een biologisch plausibel visueel model.

Typische toepassingen van de methode zijn: aanschafbeslissingen, afnametests, routinetests, certificering en het ontwerpen van nieuwe camerasystemen. De methode is reeds met succes toegepast voor dagzichtsysteem, warmtebeeldcamera's, helderheidsversterkers, en röntgenbagagescanners en is kandidaat voor diverse standaarden. Tijdens de presentatie zal aandacht worden besteed aan de achtergrond, validatie en toepassing van de TOD methode en zal een recent experiment aan de orde komen waarin de winst van dynamische beeldverbetering wordt vastgesteld.

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sessie 5 (parallel met sessie 4)

The Müller-Lyer illusion and far-aiming movements

Simone R. Caljouw, John van der Kamp, Geert J. P. Savelsbergh

Neuropsychologists have endorsed the view that a dissociation exists between visual information for the guidance of goal-directed movement (dorsal system; vision for action) and visual information to obtain knowledge about the world around us (ventral system; vision for perception). Vision for perception is considered to be a slow, long-lived process that involves allocentric sources of information (i.e target context). In contrast, vision for action is almost instantaneous, slow-lived, and primarily involves egocentric information. This dissociation predicts that visually guided movements should be largely immune to the perceptually compelling changes produced by pictorial illusions such as the Müller-Lyer illusion. Although most attention is on the dissociation between the two systems (e.g. Milner Goodale, 1995; Glover, 2004), it is clear that both systems are closely intertwined in the course of action (Rossetti Pisella, 2002). Therefore, our research aims to unravel conditions under which goal-directed actions, such as far-aiming movements, are affected by the Müller-Lyer illusion.
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sessie 5 (parallel met sessie 4)

Haptic teleoperation - perception based design

Goran Christiansson

Haptic teleoperation - remote controlled robotic tools with force feedback - have been used for more than 50 years in the nuclear research labs, later also in underwater operations. The current trend in this field is to develop haptic teleoperators for surgery and for space operations. The traditional method is to use existing robotic technology and improve the hardware characteristics based on classic performance measures, such as high stiffness and symmetric bandwidth. At the Delft Haptics Laboratory, we work on new mechatronic concepts for teleoperation based on experiments and insights in the perception of haptic discrimination tasks. This presentation outlines the insights from the psychophysics experiments on size and stiffness discrimination for grasping tools and how those results generated a new set of design requirements. We have shown that it is possible to achieve excellent teleoperated performance with a low-stiffness, safe teleoperator slave, in contrast to the difficulties with classic hard robotic tools, in 1-dof grasping tasks.
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sessie 5 (parallel met sessie 4)

Het combineren van tactiele en proprioceptieve informatie in een haptische zoektaak

Krista Overvliet, Jeroen Smeets, Eli Brenner

Om te onderzoeken hoe goed mensen zijn in het combineren van tactiele en proprioceptieve informatie hebben we een haptisch zoeken experiment uitgevoerd. De proefpersonen moesten of een cylinder, of een rechthoek of een gedraaide kubus zoeken tussen andere kubussen. De voorwerpen werden op een grid geplaatst. Het start voorwerp had dezelfde vorm als het doel wat gevonden moest worden. Om een cylinder te detecteren is er alleen tactiele informatie nodig, terwijl je voor het detecteren van een gedraaide kubus of een rechthoek beide bronnen van informatie kunt gebruiken. De rechthoek en de gedraaide kubus waren het moeilijkst om te vinden; de zoektijden waren hoger en er werden meer fouten gemaakt dan bij het detecteren van een cylinder. Dit laat zien dat het combineren van proprioceptieve en tactiele informatie moeilijker is dan gebruik maken van alleen maar tactiele informatie in een haptische zoektaak.
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sessie 5 (parallel met sessie 4)

Haptische perceptie van materiaaleigenschappen

Wouter M. Bergmann Tiest

In het dagelijkse leven gebruiken we onze tastzin vaak om materialen te beoordelen - ruwheid, indrukbaarheid, stroefheid, al dan niet koud aanvoelend zijn belangrijke eigenschappen die met de tast worden waargenomen. Maar hoe goed zijn we daarin, en hoe is ons gevoel gerelateerd aan de fysieke waarden? Om dit te meten is een aantal experimenten uitgevoerd. Met behulp van een groeperingstaak en multidimensional scaling werden gemeten fysieke waarden gecorreleerd met waarnemingen van proefpersonen. Hieruit volgde een exponentieel verband tussen fysieke en waargenomen ruwheid en indrukbaarheid. Met een ordeningstaak werd bepaald welke fysieke definitie van ruwheid het beste past bij waargenomen ruwheid. Het bleek dat er niet een enkele beste definitie was, en dat sommige proefpersonen meer aandacht schonken aan de hoge-frequentiecomponenten van ruwheid, en anderen meer aan de lage-frequentiecomponenten. Om te beoordelen hoe goed we onderscheid kunnen maken tussen warm aanvoelende materialen (zoals hout) en koud aanvoelende materialen (zoals metaal), werd een experiment gedaan waarbij op kunstmatige en gecontroleerde wijze warmte aan de vinger onttrokken werd. Hierbij bleek de drempelwaarde te liggen op 40% van de standaardwaarde. Tenslotte is de invloed vastgesteld van de omgevingstemperatuur op de waarneming van hoe koud een materiaal aanvoelt. Hierbij werd het omkeereffect bij hoge temperaturen gekwantificeerd.
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sessie 5 (parallel met sessie 4)

Crossmodale perceptie bij TNO

Nienke Weder, Jan van Erp, Alexander Toet, Peter Werkhoven

Het menselijke waarnemingssysteem heeft de neiging om multisensorische signalen vanuit de zelfde bron te combineren. Wanneer tegelijkertijd gepresenteerde series pulsen in twee modaliteiten niet overeenkomen maakt het brein het aantal waargenomen pulsen congruent, dit heet het 'illusory flash effect'. In een eerste experiment is dit fenomeen onderzocht bij combinaties van snelle reeksen visuele flitsen en tactiele taps. Ook is onderzocht welke rol aandacht hierbij speelt. Momenteel wordt dit onderzoek verder uitgebouwd en wordt er een nieuw paradigma ontwikkeld om de verwerking van multisensorische informatie op hoger cognitief niveau te onderzoeken. Hierbij gaat het om het geheugen voor verschillende combinaties van

multisensorische informatie. Fundamenteel onderzoek naar multisensorische waarneming en in het bijzonder crossmodale perceptie is relevant voor het ontwerpen van ergonomische mens-machine interfaces. Het doel van dit project is het verzamelen van kennis om multisensorische informatie optimaal te combineren en zo uiteindelijk de prestaties van de gebruiker te verbeteren.

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sessie 7, plenair

Illusions interpretations

Rob van Lier

The visual system rapidly generates a lively impression of the world around us. The actual percept, however, can have quite surprising properties given a particular stimulus (as is the case, for example, in various filling-in phenomena). In this talk, I will give a brief overview of various illusory appearances that we have studied in recent years. Some of them are relatively vivid and stable; others are more vulnerable to influences like knowledge and attention. In all cases they are a perfect entrance to study the underlying perceptual mechanisms. Special attention will be given to modal and amodal completion and to certain brightness phenomena.

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sessie 7, plenair

Bewegingswaarneming en -ziekte

Jelte E. Bos, Suzane A.E. Nooij

Hoewel we beweging vooral visueel, vestibulair en somatosensorisch waarnemen, hebben we bij TNO ons in het verleden vooral op het vestibulaire deel gericht. Kennis over het evenwichtsorgaan (de halfcirkelvormige kanalen en otolieten), signaalverwerking door het centraal zenuwstelsel, en over regeltechniek en de relativiteitstheorie (Einstein's equivalentieprincipe) spelen hierbij een rol. Deze kennis heeft ertoe geleid dat we een groot aantal bewegingsillussies nu denken te begrijpen en in ieder geval aardig met rekenmodellen kunnen voorspellen. Omdat (een milde vorm van) desoriëntatie altijd vooraf gaat aan bewegingsziekte (wagenziekte, zeeziekte, luchtziekte, cybersickness en zelfs space sickness), kan met deze kennis ook bewegingsziekte worden begrepen en voorspeld. Naast deze theoretische zaken zullen voorbeelden gegeven worden van hoe deze kennis door TNO in de praktijk wordt toegepast.

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sessie 7, plenair

Visual Recalibration and Selective Adaptation in Auditory-Visual Speech Perception: Contrasting Build-up Courses

Sabine van Linden, Jean Vroomen, Béatrice de Gelder, and Paul Bertelson

Exposure to incongruent auditory and visual speech produces both visual recalibration and selective adaptation of auditory speech identification. In an earlier study, exposure to an ambiguous auditory utterance (intermediate between /aba/ and /ada/) dubbed onto the video of a face articulating either /aba/ or /ada/, recalibrated the perceived identity of auditory targets in the direction of the visual component, while exposure to congruent non-ambiguous /aba/ or /ada/ pairs created selective adaptation, i. e. a shift of perceived identity in the opposite direction (Bertelson, Vroomen, de Gelder, 2003). Here, we examined the build-up course of the after-effects produced by the same two types of bimodal adapters, over a 1 to 256 range of presentations. The (negative) after-effects of non-ambiguous congruent adapters increased monotonically across that range, while those of ambiguous incongruent adapters followed a curvilinear course, going up and then down with increasing exposure. This pattern is discussed in terms of an asynchronous interaction between recalibration and selective adaptation.

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Lijst van aangemelde deelnemers workshop 13 oktober 2006.

Goran Christiansson	Haptics Lab, TU Delft, AIO
Eric Groen	TNO D&V, Human Factors
John J. van den Dobbelsteen	TU Delft, BioMechanical Engineering
Rolph Houben	AMC
Frans A. Bilsen	voorheen TUD
Mark Houben	TNO D&V, Human Factors
Richard van Wezel	Functional Neurobiology, Utrecht University
Jacob Duijnhouwer	Helmholtz Instituut, Functionele Neurobiologie
Christa van Mierlo	VU Amsterdam, Bewegingswetenschappen
Jelte E. Bos	TNO D&V, Human Factors
Eli Brenner	Human Movement Sciences, VU
Dik J. Hermes	Human Technology Interaction, Eindhoven
Frans Verstraten	Universiteit Utrecht / Hoogleraar
Martijn Agterberg	UMC Utrecht, promovendus
ChrisMuller	PhD-student-VrijeUniversiteitAmsterdam-FBW
Myrthe Plaisier	Universiteit Utrecht (AIO)
SylviaC.Pont	Helmholtz Instituut, Fysica van de Mens, UU
Denise de Grave	Bewegingswetenschappen, VU, Amsterdam
Chris Paffen	Helmholtz Institute, Universiteit Utrecht
Othmar Schimmel	Technische Universiteit Eindhoven
Bart Melis-Dankers	Visio Noord Nederland, klinisch fysicus videoloog
Hans van der Steen	Erasmus MC, Director Master Neuroscience Program
Frouke Hermens	EPFL (Zwitserland)
Dirkjan Krijnders	AIO Auditory Cognition Group, RuG
Dr. Wouter M.Bergmann Tiest	Fysica van de Mens, Universiteit Utrecht
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Sabine van Linden	Cognitive Neuroscience Laboratory, Tilburg University
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Sven Vrins	Nijmeegs Instituut voor Cognitie en Informatie
Tjeerd Andringa	Auditory Cognition Group, Artificial Intelligence, RuG
Herman Talsma	Visio ZWN
Martijn Lamers	Nijmegen Institute for Cognition and Information
Tony Vladusich	Post-doc, UMC Groningen
Katinka van der Kooij	Universiteit Utrecht, Helmholtz Instituut, AiO
Simone Caljouw	Faculteit der Bewegingswetenschappen, VU
Jeroen Benjamins	Universiteit Utrecht / Promovendus

Roger Bours	Universiteit Utrecht, Neurobiologie, AIO
Rob van Lier	NICI, Radboud universiteit Nijmegen (UD)
Adelbert Bronkhorst	TNO D&V, Human Factors
Tammo Houtgast	KNO / Audiologie, VU medisch centrum Amsterdam
A. A. Zekveld	KNO / Audiologie, VU medisch centrum Amsterdam
Krista Overvliet	Faculteit der Bewegingswetenschappen, VU
Matthias Treder	Nijmegen Institute for Cognition and Information
Inge Volman	Master Student Cognitive Neuroscience
Peter De Graef	K.U.Leuven
Piet Bijl	TNO D&V, Human Factors
Wim van Damme	Sensis; klinisch fysicus - visuoloog
PJ Petiet	MSc. AI, Vrije Universiteit
Tobias Borra	Psychonomie, Universiteit Utrecht
Marcel Lucassen	TNO D&V, Human Factors
Nienke Weder	TNO D&V, Human Factors
Ignace Hooge	Psychonomie, UU
Erwin George	VU-mc
Helen Anema	Psychonomie Universiteit Utrecht/ Aio
Frans W. Cornelissen	RU Groningen
Thamar van Esch	AIO Klinische en experimentele audiologie, AMC
Han Neve	Sensis; klinisch fysicus - visuoloog
Gert Kootstra	Kunstmatige Intelligentie, Rijksuniv. Groningen
Bernard van der Horst	Universiteit Utrecht, Helmholtz Instituut
Paul Lemmens	RU Nijmegen, TU Delft (postdoc)
Rob van Eijk	Technische Universiteit Eindhoven
Ronald van Buuren	TNO D&V, Human Factors
Frank Meijer	UTwente: Cognitive Psychology and Ergonomics
Egon L. van den Broek	User-System Interaction group, CTIT, UT
Tom Goossens	Technische Universiteit Eindhoven
Leendert van Maanen	Kunstmatige Intelligentie, RuG
Anton Wijbenga	Kunstmatige Intelligentie (RuG)
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Luuk Franssen	Nederlands Instituut voor Neurowetenschappen
Jaap Beintema	TNO D&V, Human Factors
Rianne Supèr	Senior Specialist TC Colorimetry, AkzoNobel CR
Geert-Jan van den Kieboom	Group Leader TC Colorimetry, AkzoNobel CR
Sorin M. Iacob	Telematica Instituut

Jan-Maarten Luursema
Menno Israel
F. van der Sluis
Annemiek van Drunen
Bram Sanders
Garmt Dijksterhuis
K.S.Rhebergen
ilse catharina van opzeeland
Chris Janssen
Armin Kohlrausch
Chris Klink
Diane Lamb
Caro Wiering
Felicien Vallet
Jan Wouters
N. Le Goff
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Programma 2008

Het programma van de Dag van de Perceptie 20 juni 2008 is te downloaden als [pdf](#). Het was als volgt opgebouwd:

- 09:00 Ontvangst met koffie
- 09.30 Welkomstwoord door het organisatiecomité
Introductie door de dagvoorzitter: prof. John van Opstal, Donders Instituut Neuroscience,
Radboud Universiteit Nijmegen
- 09:40 plenaire sessie 1
- 11:00 koffie break, ophangen en inspectie posters
- 11:30 parallele sessies:
 - sessie 2: auditief
 - sessie 3: visueel I
- 12:30 lunch met posters en demo's
- 14:00 parallele sessies:
 - sessie 4: visueel II
 - sessie 5: multimodaal & haptisch
- 15:30 koffie en poster break
- 16:00 plenaire sessie 6
- 17.00 afsluiting en borrel

Plenaire presentaties duren 20 minuten per spreker (inclusief 4 minuten discussie).

Parallele presentaties duren 15 minuten per spreker (inclusief 3 minuten discussie).

Het staat de spreker vrij het verhaal in Nederlands of Engels te houden, maar bij voorkeur sheets Engelstalig.

Abstracts Dag van de Perceptie 20 juni 2008

1. Pip and Pop: Non-spatial auditory signals improve visual search

Erik van der Burg, *Christian N.L. Olivers, Adelbert W. Bronkhorst, Jan Theeuwes*
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Searching for an object within a cluttered, continuously changing environment can be a very time consuming process. Here we show that a simple auditory pip drastically decreases search times for a synchronized visual object that is normally very difficult to find. This effect occurs even though the pip contains no information on the location or identity of the visual object. The experiments also show that the effect is not due to general alerting (as it does not occur with visual cues), nor due to top-down cueing of the visual change (as it still occurs when the pip is synchronized with distractors on the majority of trials). Instead, we propose that the temporal information of the auditory signal is integrated with the visual signal, generating a relatively salient emergent feature that automatically draws attention. Phenomenally, the synchronous pip makes the visual object pop out from its complex environment, providing a direct demonstration of spatially non-specific sounds affecting competition in spatial visual processing.

2. Elektrofysiologische en psychofysische metingen van het auditieve systeem

Martijn J.H. Agterberg *Marloes van den Broek, Ingrid H.C.H.M. Philippens, Huib Versnel, John C.M.J. de Groot, Sjaak F.L. Klis*
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In Nederland krijgen jaarlijks ongeveer 300 dove en zeer ernstig slechthorende mensen een cochleair implantaat (CI). Een CI geeft dove mensen de mogelijkheid om te horen door directe elektrische stimulatie van de gehoorzenuw. De resultaten van deze ingreep zijn nogal wisselend. Sommige mensen kunnen na enige tijd weer telefoneren, terwijl anderen zeer weinig profijt hebben van deze ingreep. Eén van de mogelijke oorzaken is degeneratie van spirale ganglioncellen (SGC) in de gehoorzenuw. Onderzoek in dove cavia's heeft aangetoond dat degeneratie van SGC voorkomen kan worden door toediening van neurotrofe factoren in de cochlea. De hypothese is dat meer en beter functionerende SGC resulteren in een betere prestatie met een CI. In samenwerking met TNO-Rijswijk werken we aan de ontwikkeling van een proefdiermodel waarmee deze hypothese getoetst kan worden. Cavia's wordt in een 'shuttle box' aangeleerd om een aversieve prikkel te vermijden. De ongeconditioneerde stimulus is een luchtpuf. De geconditioneerde stimulus is in horende cavia's witte ruis van verschillende geluidsterkten (58-88 dB SPL) en in dove cavia's een serie elektrische pulsen (111 pps) van verschillende stroomsterkten (142-400 μ A). Cavia's leren de gedragsrespons op de geconditioneerde stimuli in een aantal trainingssessies aan. Deze resultaten tonen aan dat dit proefdiermodel gebruikt kan worden om de hypothese te toetsen.

3. Thresholds for the perception of translation to quantify and localize vestibular deficits

Maurice Janssen *Martijn Wolters, Herman Kingma*
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Introduction: Thresholds of perception of rotation, translation and tilt to characterize vestibular function have been investigated by many researchers world wide to our knowledge since 1840. They encountered fundamental problems with technology, impact of other senses, reproducibility and habituation. The introduction of eye and body movement detection techniques shifted the interest to development of tests with objective outcome parameters. Unfortunately, in the last decades it became clear that many of these “objective” methods suffer from a low sensitivity and specificity and often no abnormal reflexes can be detected despite a clear history pointing to a vestibular deficit. In this study we report about our research focusing on perception of movement and body orientation again as a method to quantify vestibular function, analogue to audiometry and detection of visual acuity in ophthalmology, using advanced technology currently available.

Methods and Materials: After informed consent, 30 healthy subjects volunteered for this study (age range 21-57). None of these subjects had any sign or complaint that could be related to a vestibular, ophthalmologic, ORL or neurological disorder. Basic ORL, neurological and vestibular examination was normal. Also 6 patients with an acquired (gentamycine intoxication and other spontaneous degenerative process e.c.i.) bilateral vestibular hyporeflexia were examined (age range 43-68). These patients showed no responses to caloric irrigation, velocity steps and head impulses.

In all subjects perception of translations was quantified. Thresholds were detected with a maximum attempt to exclude all other than vestibular sensory cues. Whole body translations were generated by a home designed and built motor driven 4.0 m long linear sled (IDEE) using a translation profile with pseudo-random linear accelerations ranging from 0 to maximum 15 cm/s². Translations were performed in the horizontal plane, fore-backwards and sideways.

Results: The threshold of perception for translations could be detected with good. The use of a pseudorandom paradigm reduced habituation considerably. The thresholds of the patients were significantly enhanced and all fell outside the 95% confidence interval of the healthy subjects.

Conclusion: The current study stimulates us to further explore thresholds of perception as a relevant clinical outcome parameter.

4. An irrelevant tone can influence peri-saccadic mislocalisation

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Flashes presented around the onset of a saccade are mislocalised in the direction of the saccade target. In order to evaluate whether uncertainty about the moment of the flash contributes to this peri-saccadic mislocalisation, we examined whether the mislocalisation is influenced by an irrelevant tone that was presented at different moments around the time of the flash. When a tone was presented before the flash, the time course of the mislocalisation was shifted, as if the flash had been presented earlier. The amplitude of the mislocalisation was not influenced by the tone. To explain the temporal shift, we used a model based on the following reasoning. If the flash and tone are judged to occur simultaneously, the perceived time of this event will be between the time of the flash and that of the tone. If we describe the chance of the flash and tone being regarded to occur simultaneously by a Gaussian with a temporal uncertainty (SD) of 55 ms, the resulting model could describe the data well if the tone is considered to contribute at least 20% to the estimated timing of the flash. We conclude that temporal uncertainty is indeed a factor in peri-saccadic mislocalisation.

5. Estimating speech intelligibility in quiet and noise with a cochlear-compression model

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The standard model to estimate speech intelligibility is the Speech Intelligibility Index, [ANSI S3.5-1997]. This model predicts the proportion of available speech information for speech presented in noise. This proportion is called the SII. For speech-reception measurements using short meaningful sentences presented in stationary noise, this model predicts a constant SII when speech and noise are presented near normal speech levels (65 dBA). However, for very low speech levels (with the absolute threshold as 'noise floor'), SII predictions are much less reliable. The same is true for predictions for hearing-impaired listeners. In both these situations, the amount of cochlear compression in the listener is much smaller than for normally-hearing listeners near normal speech levels. To overcome this problem, we have created a speech-intelligibility model that includes cochlear compression as a function of level and absolute threshold (hearing impairment). It is based on a loudness model for normally-hearing and hearing-impaired listeners [ANSI S3.4-2007], which we have extended to predict speech intelligibility. The present model and the standard SII were used to predict speech-reception thresholds in quiet and noise for both normally-hearing and hearing-impaired listeners. The present model predicted speech intelligibility with less variability than the standard SII.

6. Haptic search for shapes

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In daily life we often reach into our pocket, for instance, to take out our keys from among all other items that might be in there. This is a common example of a haptic search task. Depending on what the other items are, this can be fairly easy or very difficult to do. An important cue for recognizing the keys is of course shape. In this study we investigated saliency of shape in terms of edges and curvature using a search task. Subjects had to grasp varying numbers of three-dimensional shapes (spheres, cubes, ellipsoids, tetrahedrons and cylinders) and respond as fast as possible whether a certain target shape was present. Response times were measured as a function of the number of items. The results show that search was particularly efficient when the target item had edges and the distractor items did not and vice versa. The data also suggests that the dynamics of the shapes sliding along each other plays an important role in haptic search. This physical interaction between the items is specific for the haptic modality in which items can be physically manipulated and has never been investigated before.

7. The benefit obtained from textual output of an Automatic Speech Recogniser during speech comprehension in noise

Adriana Zekveld (VUmc), *Sophia Kramer (VUmc), Judith Kessens (TNO), Marcel Vlaming (VUmc), Tammo Houtgast (VUmc)*
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Hearing impaired persons often experience difficulties comprehending speech in adverse listening situations. Using an Automatic Speech Recognition (ASR) system to automatically generate visually presented subtitles may support speech comprehension during telephone conversations. Unfortunately, ASR output contains recognition errors, and it is often generated somewhat delayed relative to the speech.

First, we examined the effects of age, hearing loss, working memory, and linguistic skills on the objectively measured benefit obtained from automatically generated subtitles. Normal hearing and hearing impaired participants performed unimodal (auditory speech) and audiovisual (auditory speech and visual text) tests of speech comprehension in noise. The automatically generated subtitles improved speech comprehension in noise for all ASR accuracies and delays covered by the study. Delaying the presentation of the text reduced the benefit and increased the listening effort. Hearing-impaired participants with relatively low unimodal speech comprehension obtained greater benefit from the ASR output than hearing-impaired participants with better unimodal speech comprehension. We observed an age-related decline in the working-memory span of the normally-hearing listeners. A higher age and a lower working memory span were associated with increased effort required to use the ASR output to improve speech comprehension.

In a follow-up study, hearing impaired participants subjectively evaluated the benefit obtained from the automatically generated subtitles during listening to short stories by telephone. For realistic ASR accuracies and text delays, the participants indicated that reading the imperfect text while listening to the speech was difficult. A second experiment was performed to examine whether improving the ASR accuracy and/or shortening the delay of the presentation of the text improved the subjective evaluation of the speech comprehension benefit.

8. A comparison between interaural level difference and interaural correlation uncertainty on binaural signal detection thresholds

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Experiments were performed to study the effect of the presence of interaural level differences (ILDs) on binaural detection abilities. The subjects had to detect an interaurally out-of-phase 500-Hz tone in the presence of a diotic noise masker that had a bandwidth of either 1 kHz, 100 Hz or 10 Hz. Experiments were conducted for both frozen and running-noise conditions and ILDs up to 30 dB were applied to both signal and masker. The results indicate an ILD dependency that varies with the bandwidth of the masker. Furthermore, with increasing ILDs, the difference in detection thresholds between frozen and running-noise conditions was larger for narrow-band noise conditions. Similar observations were made by previous investigations on the influence of reduced masker correlation. Both data sets are compared in order to find possible similarities in the mechanisms involved in the detection tasks.

9. Saliency effects are short-lived

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Salient objects in the visual field tend to attract attention and the eyes. To account for this, models of visual selection assume that people possess a saliency map, a topographical representation of the relative distinctiveness of objects in the visual field (e.g., Itti Koch, 2001). It is often assumed that this saliency map is persistently present such that visual selection can be continuously affected by the information it contains. In the present series of experiments we demonstrate that saliency affects selection only during the short time interval immediately following the onset of a visual scene. In a saccadic target-selection task, people are accurate in making an eye movement to the most salient element in a display when response latencies are short, but are at chance when response latencies are long. In a manual discrimination task, people are more accurate in making a judgement of saliency with brief than with long display-presentation durations. Finally, in a probe-RT task, saliency effects are only present immediately after the presentation of a display. These results suggest that the brain does not continuously hold information concerning the relative saliency of different objects in the visual field. Instead, after visual input enters the brain, relative saliency appears to be only transiently represented.

10. 3D vorm waarneming in context

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Context kan de waarneming van vorm verstoren, zoals in vorm contrast illusies. 3D vorm wordt waargenomen uit een combinatie van diepte cues en zowel cue-afhankelijke als cue-onafhankelijke representaties bestaan. Wij beantwoorden de vraag of beide typen representatie een rol spelen bij de integratie van vorm en context. Hiertoe definieerden wij vorm en context in dezelfde of in een verschillende diepte cue en vergeleken de context bias tussen condities. Een centraal gevouwen oppervlak en flankerend oppervlak waren gedefinieerd door binoculaire dispariteit of beweging. In een 'binnen-cue' conditie waren zij door dezelfde cue gedefinieerd en in een 'tussen-cue' conditie waren zij door een verschillende cue gedefinieerd (binoculaire dispariteit of beweging). Waarnemers vergeleken de vouwhoek van het centrale oppervlak met een constante referentie. Zo konden wij de bias berekenen. De context veroorzaakte een bias in beide condities, maar de richting van de bias verschilde: contrast in de 'binnen-cue' conditie en attractie in de 'tussen-cue' conditie. Hieruit concluderen wij dat zowel cue-afhankelijke als cue-onafhankelijke representaties een rol spelen bij de integratie van vorm en context.

11. Interactive exploration of 3D objects and individual differences in visuo-spatial abilities

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When we study complex matter, learning from theory is often not enough: We need to experience it in practice. However, sometimes it is impossible to present a real life experience. There are various situations thinkable, when practice is not feasible; when it is expensive (e.g. aerospace), unethical (e.g. medical training) or indefinite (e.g. engineering and design). Computer games can offer a solution in that they can simulate these situations, so that a virtual experience becomes possible. This raises two questions: 1) What exactly is the importance of interactivity, and 2) Who benefits from it? In the current study, we investigated the added value of interactivity when exploring abstract (3D) objects and whether the individual's abilities are of importance. In two experiments, 36 participants were divided into a low, middle, and high visuo-spatial ability (VSA) group, which was determined by Vandenberg and Kuse's MRT-A test (1978). In the experiments, the influence of four types of exploration (none, passive 2-D, passive 3-D and interactive 3-D) on building 3-D mental representations was investigated. First, 24 simple and 24 complex objects (consisting of respectively 3 and 5 geons; Biederman, 1987) were explored and, subsequently, tested through a mental rotation test. Results revealed that participants with a low VSA benefit from interactive exploration of objects opposed to passive exploration. This refines James et al.'s findings (2001), who reported a general increased performance with interactive as compared to passive exploration. Our results underline that individual differences are of key importance when investigating the human's visuo-spatial system, but also when developing virtual learning environments.

12. Priming effects on visual classification

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Ambiguous figures can lead to different perceptual interpretations. In this study, the dynamics of this perceptual interpretation were investigated in a priming experiment. Here, the ambiguous figures consisted of either 80% of one interpretation and 20% of another, or 70% and 30%, or 60% and 40%. They were preceded by three types of primes, namely congruent, incongruent and unrelated words. By making use of forced-choice, participants responded by choosing one of two interpretations. A strong preference for the dominant interpretation was found. In addition, being presented with a lower degree of ambiguity (80%-20%) meant a decrease in reaction times compared to a higher degree of ambiguity (60%-40%). Most interestingly, a priming effect was found; in comparison to the unrelated condition, a facilitation effect was found in the congruent condition and an interference effect in the incongruent condition. The current findings suggest that priming influences the processes underlying interpreting ambiguous figures. These results provide insights in how context influences the speed of the interpretation of ambiguity in our visual environment.

13. Ironic effects in penalty shooting: Avoid the to-be-avoided!

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The intention to avoid a thought or action may ironically increase the tendency to engage in this thought or action. Using a negative instruction not to shoot at the keeper, Bakker et al. (2006) showed that ironic effects in penalty shooting are mediated by changes in gaze behavior. It remained unclear whether the denial in the instruction ("not") or mentioning of the to-be-avoided area ("keeper") was responsible for the ironic effects. Therefore, the current study examined ironic effects in indoor penalty kicks using one positively worded instruction (pass-keeper) and one negatively worded instruction (not-keeper) to evoke ironic effects. When ironic effects occurred they were similar in the two instruction conditions both with respect to gaze and aiming behavior. Therefore, it is concluded that priming of what should be avoided (the keeper) causes the ironic effects in gaze and aiming behavior and not the negative wording in the instruction.

14. Gaze in Action and Perception

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Following Goodale and Milner's (1992) proposal to distinguish the dorsal and ventral systems on basis of the functional demands they serve (i.e. action and perception), a vast literature has emerged that scrutinized if the dorsal and ventral systems indeed process information into egocentric and allocentric codes in accordance with their respective functions. However, a corollary of Goodale and Milner's original proposal, that these functional demands also impose different constraints on information detection, has been largely overlooked. In the present study, we measured gaze patterns to investigate how information detection for action and perception differs. In two conditions, participants (N=11) grasped or made a manual estimate of the length of a shaft embedded in a Müller-Lyer configuration. The illusion significantly affected the manual estimates, but not the hand aperture during grasping. In line with these behavioural findings, significant differences in gaze patterns were revealed between the two tasks. Participants spent more time looking at areas that contain egocentric information (i.e. centre of the shaft) when grasping as compared to making a manual length estimate. In addition, participants, made more gaze shifts (i.e., especially between the two areas surrounding the shaft endpoints and including the arrowheads) when making the manual length estimate, enabling the pick of allocentric information. The differences were more pronounced during task execution as compared to task preparation (i.e., before movement onset). These results support the contention that the functional distinction between the dorsal and ventral systems is not limited to the processing of information, but also encompasses the detection of information.

15. Effects of horizontal and vertical Field-of-View restriction on manoeuvring through complex structured environments

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Field-of-view (FOV) restrictions are known to affect human behaviour and to degrade performance for a range of different tasks, such as distance estimation, control of heading and postural equilibrium. However, the relationship between manoeuvring performance and FOV size is currently not fully known. Although considerable research has been devoted to the horizontal angular extent of the visual field, rather less attention has been paid to the vertical angle. We discuss here the results of different experiments performed to investigate the effects of both horizontal and vertical FOV restriction on the performance of participants manoeuvring through complex structured environments. The tasks to be performed within these environments consisted of avoiding/crossing obstacles which required different bodily movements.

It can be concluded that restricting the FOV reduces manoeuvring performance significantly. Both speed and accuracy of movement decreased with a reduced FOV. Furthermore, we show that for certain configurations an enlargement of the vertical angle constitutes a greater performance increase than a similar enlargement of the horizontal angle. The relationship between FOV restriction and manoeuvring performance that was determined can be used to formulate requirements for FOV restricting devices that are deployed to perform time-limited human locomotion tasks in complex structured environments, such as night-vision goggles and head-mounted displays used in training and entertainment systems.

16. Subjective evaluation of enhanced imaging systems

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The major evaluation criterion to assess the subjective performance of an imaging system is perceived image quality. Display manufacturers are mainly interested in the relation between perceived image quality and the technology parameters of the imaging system, so that they can optimize their displays. The image quality circle is a commonly accepted framework to model this relation, by breaking up image quality in different attributes such as sharpness, colorfulness and brightness. 3D-TV systems, however, go beyond the concept of image quality. Research has shown that, although 3D images and videos are clearly more appreciated by viewers, the concept 'image quality' does not take this added value of depth into account. Concepts such as 'naturalness', 'presence' and 'viewing experience' have been suggested as alternatives to assess the overall performance of 3D displays. We investigated the effect of 3D on image quality and on these higher-level concepts. Also the effect of Ambilight, another new display enhancement, was included. Results show that image quality is indeed not affected by 3D and Ambilight. 'Naturalness', 'presence' and 'viewing experience' are found to be more useful, but different concepts. Each of them weighs the involved attributes in different ways. Which concept to use depends on the circumstances and on the research question.

17. Experimental test of visuomotor updating models that explain mislocalization of saccadic gaze shifts

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Localization of a brief visual target is inaccurate when presented around saccade onset. Perisaccadic mislocalization is maximal in the saccade direction, and varies systematically with the target-saccade onset disparity. It has been hypothesized that this effect is either due to a sluggish representation of eye position, to low-pass filtering of the visual event, to saccade-induced compression of visual space, or to a combination of these effects. Despite their differences, these schemes all predict that the pattern of localization errors varies systematically with the saccade amplitude and kinematics. We tested these predictions for the double-step paradigm, by analyzing the errors for saccades of widely varying amplitudes. Our data show that the measured error patterns are only mildly influenced by the primary-saccade amplitude over a large range of saccade properties.

An alternative possibility, better accounting for the data, assumes that around saccade onset the perceived target location undergoes a uniform shift in the saccade direction that varies with amplitude only for small saccades. The strength of this visual effect saturates at about 10 deg, and also depends on target duration. This visual-shift model predicts that similar error patterns are expected for much larger head-free gaze shifts. In a second series of experiments we verified this prediction. Hence, we propose that perisaccadic mislocalization results from errors in visual-spatial perception, rather than from sluggish gaze-motor feedback.

18. A cockpit display with two depth layers: visual search and attentional segregation

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Analogous to the introduction of colour displays, 3D displays hold the potential to expand the information that can be displayed. Going beyond colour, separation by depth has been shown to enable very fast ('parallel') visual search (Nakayama & Silverman, 1986). The ability to focus exclusive attention on a depth plane provides a potentially powerful extension to current command & control displays.

We have developed a depth display with two physically separated layers, specifically for demanding work environments. As expected, conjunction search times become parallel when information is split in two depth layers, but only when the stimuli are simple and non-overlapping. Complex and overlapping imagery in the rear layer still interfere with visual search in the other (front) layer: dual-layer search was faster than single layer search ($p < 0.01$) but slower than the control condition without a background ($p < 0.01$). The experimental paradigm provides a methodology to quantify the added value of 3D designs and displays. A flight-simulator experiment shows a positive effect on horizontal flight accuracy and gaze control (both $p < 10^{-4}$). However, the test-pilots were only marginally positive. Introducing 3D displays in the cockpit faces two challenges: perfecting the hardware and identifying optimal image designs.

19. Auditory capture during focused visual attention

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It is well known that a sound coming from a particular location can capture visual attention, as previously shown in crossmodal cueing studies. The current study shows that when performing a task involving the discrimination of a visual target, an irrelevant auditory cue near the target location results in performance benefits relative to a neutral condition. In contrast, when the irrelevant auditory cue comes from a non-target location there are performance costs. We have determined whether it is possible to suppress such auditory capture by endogenously focusing visual attention to a restricted area in space. Previous studies have shown that endogenously focusing attention can eliminate capture by visual stimuli. Unlike these studies, the current study shows that even when attention is highly visually focused, auditory stimuli still capture visual attention. However, in this case there are only performance costs from auditory stimuli coming from the non-target location; cueing benefits of a sound presented near the visual target are no longer present.

20. Ontwerp voor een multimodale systeem-intuïtie

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Het menselijk, informatieverwerkend mechanisme dat op zoek gaat naar betekenisdragende informatie in de wereld om ons heen noemen we intuïtie. Onze intuïtie is een zoekstelsel voor betekenissen. De intuïtie neemt betekenisdragende informatie waar, op het moment dat het ontstaat zoals tijdens een gesprek of tijdens het luisteren naar muziek of tijdens het waarnemen van gedrag van anderen. Dat zien we, als onderzoekers, als het waarnemen van ontluikende inhoud.

Zoekprocessen worden in het algemeen gebruikt om aan een gegeven onderwerp gerelateerde informatie te vinden. Zoekprocessen kunnen echter ook zelfstandig werken met als doel informatie te ordenen. Ze kunnen dit doen in de vorm van autonome agents; een pro-actieve manifestaties van een blauwdruk; een opdracht die op een meta niveau is beschreven zoals "vindt alle dingen die in de wijze(n) waarop ze te construeren zijn in de verte of van dichtbij op elkaar lijken".

Dat ordenen kan vervolgens op een manier gedaan waardoor een brug gelegd wordt naar de inhoud. Zoekprocessen detecteren niet alleen nieuwe inhoud ze herkennen zoals oude zoekprocessen dat ook deden, bestaande kennis. Als het systeem bestaande kennis relateert aan nieuwe kennis kan die nieuwe kennis in een aantal gevallen onmiddellijk betekenis krijgen. Zoekprocessen kunnen dus zelfstandig op zoek gaan naar inhoud of betekenis door structuren te vinden die een relatie hebben met betekenis.

Een als hierboven beschreven systeemintuïtie is geïmplementeerd in het project *MEDIATE* (A Multisensory Environment Design for an Interface between Autistic and Typical Expressiveness Contract No. - IST-2000-26307). De intuïtie detecteert structurelementen als patronen op basis van terugkerende volgordeverschijnselen; elke gebeurtenis die meer dan eens voorkomt wordt gedefinieerd als een patroon. Patronen zijn af te leiden uit gebeurtenissen (instanties van patronen). In muziek, waar deze opvatting is ontstaan, bijvoorbeeld, herkennen we alleen patronen.

21. Emotional responses to color and texture

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The notion that people show different emotional responses to different colors is a basic assumption in many industries. Studies have shown that people report different affective associations depending on what color is perceived; i.e.: a subject might consider red to be a 'warmer' color than yellow. However, such studies are not representative for most real life situations, since only uniform color is considered. The aim of our study is threefold. First we extend on findings from the literature by investigating the combined effect of color and texture on affective associations. Secondly, we investigate how such effects can be generalized to real-world data. Thirdly, we attempt to construct automatic classification algorithms which can predict human associations based on the color and texture information of an input image. Such algorithms have potential applications in the domain of multimedia indexing, search and retrieval. At the forum we will discuss our approach and outlook. We will also present some preliminary results.

22. Auditory-Visual Visual-Tactile Temporal Recalibration and the Effect of Spatial Disparity

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It is known that the brain adaptively recalibrates itself to small (~100 ms) auditory-visual (AV) temporal asynchronies so as to maintain intersensory temporal coherence. Here we explored whether the effect also occurred for tactile-visual (TV) pairs and whether spatial disparity on AV pairs affects temporal recalibration. Participants were exposed to a train of asynchronous AV or TV stimulus pairs. Following a short exposure phase, participants were tested on an AV or TV temporal order judgement (TOJ) task. Temporal recalibration manifested itself as a shift of subjective simultaneity in the direction of the adapted lag. The shift was equally big when exposure and test stimuli were presented from the same or different locations. These results provide strong evidence for the idea that temporal recalibration is a more general phenomenon between senses instead of a phenomenon between A and V, and for the idea that spatial co-localisation is not a necessary constraint for intersensory pairing to occur.

23. Lipread induced recalibration of phonetic categories: ‘Speech mode’ vs. ‘Non-speech mode’.

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Listeners hearing an ambiguous speech sound use lipread information when categorizing the auditory phoneme (immediate bias) and adjust their phonetic categories in accordance with it (recalibration). By using perceptually ambiguous Sine Wave Speech (SWS) tokens, we explored the extent to which these effects could be observed in listeners that are either aware or unaware of the origin of the stimuli (‘speech mode’ vs ‘non-speech mode’). After exposure to (auditory ambiguous) audiovisual (AV) SWS stimuli, participants were tested with the ambiguous auditory token. Listeners in ‘speech mode’ indeed showed an immediate bias and recalibration effects whereas listeners in ‘non-speech mode’ did not. Results indicate that a ‘speech mode’ of perception is required for on-line AV integration (immediate bias) as well as lipread learning effects (recalibration) to occur.

24. Synergy effects with mobile (audio and) video telephony

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Multimodal percepts as compared to unimodal (e.g., visual, auditive) percepts contain more information and as such can advance various processes; e.g., communication. Despite, on the one hand, the vast amount of studies that illustrate this and, on the other hand, the progress in technology, (multimodal) mobile video telephony (MVT) is not used on a large scale. In a quest to explain the latter, we studied the influence of screen size on the synergy of audio and video and its influence on the illegibility of the information. The study focused on the effects of screen sizes on multimodal perception since a small screen size is a key feature of mobile phones and former research seldom examined the effects of screen size. 54 participants conducted an experiment in which the intelligibility of a standardized video-listening test was determined for three screen sizes: mobile phone, PDA and PC monitor. A signal-to-(white) noise ratio of -9dB significantly limited the intelligibility of the videos. A significant increase in intelligibility for the large compared to the small screens was found. With respect to the Quality of Service of MVT, two conclusions result: 1) the display size should be maximized and 2) already considerable amounts of noise decreases intelligibility. Consequently, we emphasize the need for both research on effects of screen size and noise on multimodal perception and technological development to develop optimal MVT.

25. Optic flow induced self-tilt perception

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Roll optic flow induces illusory self-tilt in humans. As far as the mechanism underlying this visual-vestibular interaction is understood, larger angles of self-tilt are predicted than observed. It is hypothesized that the discrepancy can be explained by idiotropic (i.e., referring to a personal head or body fixed frame of reference) and/or somatosensory cues.

To validate this hypothesis, we presented optic flow to 12 subjects under three main conditions: sitting with the head fixed, sitting with the head loose, and with a free-floating body under water. These conditions were all combined with three different initial head tilts. Actual head-tilt and self-tilt perception were measured, the latter by manipulation of an artificial horizon.

Results clearly showed that the self-tilt perception was highly dependent on optic flow. However, head-tilt was dependent on optic flow as well, and self-tilt perception was highly correlated with actual head-tilt. Still, the increase of self tilt with head tilt increased with a reduction of somatosensory cues.

Based on these data we conclude that an idiotropic frame of reference, as well as somatosensory cues do inhibit optic flow induced self-tilt perception.

26. Haptische waarneming van indrukbaarheid

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Indrukbaarheid is een belangrijke materiaaleigenschap die met de tast wordt waargenomen. Denk hierbij aan het bepalen van de luchtdruk in een fietsband of de rijpheid van een avocado. De waarneming van indrukbaarheid combineert cutane en kinesthetische informatie, maar het was nog niet bekend hoe dit precies in z'n werk gaat. De cutane informatie bestaat uit de waarneming van de vervorming van het oppervlak van de stimulus bij het indrukken. De kinesthetische informatie komt van de waarneming van de verhouding tussen uitgeoefende kracht en verplaatsing van de vingers. Wij hebben gemeten hoe goed mensen verschillen in indrukbaarheid kunnen waarnemen, en hoe deze verschillende soorten informatie gecombineerd worden. Dit hebben we gedaan door middel van discriminatie-experimenten met siliconenrubberen cilinders van verschillende hardheid. De Weberfractie voor indrukbaarheidsdiscriminatie bedroeg 14%. Toen de cutane informatie werd weggenomen door middel van metalen plaatjes, werden de discriminatiedrempels meer dan twee keer zo groot. Dit geeft aan dat driekwart van de informatie afkomstig is van waarneming van de oppervlaktevervorming, en een kwart van waarneming van de verhouding tussen kracht en verplaatsing. Deze gegevens leveren meer inzicht in de haptische waarneming van indrukbaarheid.

27. Audiovisual integration of saccade initiation in a complex scene

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To plan an appropriate action (e.g. a gaze shift) towards a novel sensory event (e.g. a flash or beep), the brain must base its response on a potentially noisy percept. Optimal combining, in a Bayesian sense, information from a single source across two modalities (e.g. vision and hearing) can help reducing perceptual noise, and increase the precision of the action. However, if an auditory and a visual event originate from two distinct, independent sources, this inflexible Bayesian integration is erroneous and potentially disadvantageous. In this study, we tested whether this assumption of inflexible, Bayesian multisensory integration holds when generating saccades to novel aligned and disparate auditory and visual events in a complex scene. By making speeded responses, the time course of the perceptual noise in the unimodal and bimodal conditions could be obtained. We found that the noise in the visual percept decreased with the time after event presentation ("speed-accuracy trade-off"), while the noise in the auditory percept remained constant. The time course of the bimodal responses could be described by an early phase in which saccades were primarily aurally guided, followed by a phase in which saccades were bimodal, concluded by a later phase in which vision spatially "captured" the auditory event ("ventriloquist effect"). These phases were well described by assuming a Bayesian-like (but not Bayesian-exact) combination of time-evolving unimodal percepts, even for spatially- and temporally-disparate events. In contrast, unimodal models of multisensory integration (e.g. race, visual dominance, auditory warning effect, and attention models) failed to predict the results. Even the employment of a different task ("localize visual event" vs "localize audiovisual event") did not influence the integration (even though reaction time was affected). Our data suggest an involuntary and rather inflexible Bayesian-like nature of bimodal integration in saccade-generation.

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9.00-9.30	Ontvangst met koffie en thee	
9.30-9.40	Welkomstwoord namens Dag van de Perceptie comité Opening door dagvoorzitter, Frans Verstraten, Hoogleraar Psychonomie UU	
sessie 1 (plenair)		
9.40-10.00	Interactions between speed and contrast tuning in area MT Richard van Wezel, Bart Krekelberg and Tom Albright Functional Neurobiology, Utrecht University	
10.00-10.20	Sound Recognition in arbitrary acoustic environments Tjeerd Andringa Auditory Cognition Group, Artificial Intelligence, RuG	
10.20-10.40	Perceiving emotions through psychophysiological signals Egon L. van den Broek, Marleen H. Schut, Joyce H.D.M. Westerink, Kees Tuinenbreijer, and Jan van Herk Cognitive Psychology and Ergonomics, Twente University	
10.40-11.00	Shining a light on materials: Physics-based human and computer vision of materials and light fields Sylvia C. Pont Fysica van de Mens, Universiteit Utrecht	
11.00-11.30	koffie en thee break	
sessie 2 (parallel met sessie 3)		sessie 3 (parallel met sessie 2)
11.30-11.45	fMRI of relational color constancy in human visual cortex Frans W. Cornelissen, Just van Es, Tony Vladusich UMC Groningen	Functional assessment of the effect of neurotrophic treatment of deafened guinea pigs M.J.H. Agterberg, H. Versnel, J.C.M.J. de Groot, S.F. Klis, G.F. Smoorenburg and F.W.J. Albers Dept. of Otorhinolaryngology, UMC Utrecht and Rudolf Magnus Institute of Neuroscience
11.45-12.00	The Brain Knows the Oblique Effect Tobias Borra, Ignace T.C. Hooge and Frans A.J. Verstraten Psychonomie, Universiteit Utrecht	Segregation of concurrent sounds by temporal envelope and binaural cues Othmar Schimmel, Steven van de Par, Armin Kohlrausch, and Jeroen Breebaart Technische Universiteit Eindhoven
12.00-12.15	Objects popping out of schemas: Putting object perception back in context Peter De Graef and Karl Verfaillie K.U.Leuven	Bimodale zinsperceptie: de integratie van gemaskeerde visueel en auditief gepresenteerde zinnen. A.A. Zekveld en T. Houtgast KNO / Audiologie, VU medisch centrum Amsterdam
12.15-12.30	Disengaging attention sets the temporal limit of attentive tracking. J.S. Benjamins, I.T.C. Hooge, M.J. van der Smagt, F.A.J. Verstraten Psychonomie, Universiteit Utrecht	Gevalideerde simulatie van visuele beperkingen door slechthoortheid Wim van Damme & Maarten Hoogervorst Sensis
12.30-14.00	Lunchbroodjes tussen posters en demo's	
sessie 4 (parallel met sessie 5)		sessie 5 (parallel met sessie 4)
14.00-14.15	Visual grouping: Temporal and spatial interactions Frouke Hermens, Frank Scharnowski, Michael H Herzog EPFL (Zwitserland)	Beeldkwaliteit van nachtkijkers bepaal je met de TOD methode Piet Bijl, Maarten Hoogervorst. TNO Human Factors
14.15-14.30	Wat zien kleurenblinden? Marcel Lucassen en Johan Alferdinck TNO Human Factors	The Müller-Lyer illusion and far-aiming movements Simone R. Caljouw, John van der Kamp, Geert J. P. Savelsbergh Faculteit der Bewegingswetenschappen, VU
14.30-14.45	Perceiving colour at a glance: a bias towards changes near fixation Eli Brenner, Jeroen J.M. Granzier, Jeroen B.J. Smeets Faculteit der Bewegingswetenschappen, VU	Haptic teleoperation - peception based design Goran Christiansson Haptics Lab, TU Delft
14.45-15.00	Seeing brightness and darkness: more dimensions than meet the eye? Tony Vladusich, Marcel P. Lucassen and Frans W. Cornelissen UMC Groningen	Het combineren van tactiele en proprioceptieve informatie in een haptische zoektaak Krista Overvliet, Jeroen Smeets, Eli Brenner Faculteit der Bewegingswetenschappen, VU
15.00-15.15	Human versus artificial texture perception Peter J. Petiet and, Egon L. van den Broek VU Amsterdam	Haptische perceptie van materiaaleigenschappen Wouter M. Bergmann Tiest Fysica van de Mens, Universiteit Utrecht
15.15-15.30	Binocular rivalry reveals negative effects of perceptual learning Chris L.E. Paffen, Frans A.J. Verstraten & Zoltan Vidnyanszky Psychonomie, Universiteit Utrecht	Crossmodale perceptie bij TNO Nienke Weder, Jan van Erp, Lex Toet en Peter Werkhoven TNO Human Factors
15.30-16.00	koffie en thee break	
sessie 7, plenair		
16.00-16.20	Illusions interpretations Rob van Lier Radboud universiteit Nijmegen	
16.20-16.40	Bewegingswaarneming en -ziekte Jette E. Bos, Suzane A.E. Nooij TNO Human Factors	
16.40-17.00	Visual Recalibration and Selective Adaptation in Auditory-Visual Speech Perception: Contrasting Build-up Courses Sabine van Linden, Jean Vroomen, Béatrice de Gelder, and Paul Bertelson Cognitive Neuroscience Laboratory, Tilburg University	
17.00-18.00	Afsluitend woord en borrel	

Programma Dag van de Perceptie, vrijdag 20 juni 2008 bij TNO

9.00-9.30	Ontvangst met koffie en thee	
9.30-9.40	Welkomstwoord namens Dag van de Perceptie comité Opening door dagvoorzitter, prof. AJ van Opstal, Donders Instituut Neuroscience, Radboud Universiteit Nijmegen	
	plenaire sessie 1 (kantine)	
9.40-10.00	Pip & Pop: Non-spatial auditory signals improve visual search. Erik van der Burg, <i>Christian N.L. Olivers, Adelbert W. Bronkhorst, Jan Theeuwes</i> Vrije Universiteit Amsterdam	
10.00-10.20	Elektrofysiologische en psychofysische metingen van het auditieve systeem Martijn J.H. Agterberg, <i>Marloes van den Broek, Ingrid H.C.H.M. Philippens, Huib Versnel, John C.M.J. de Groot, Sjaak F.L. Klis</i> UMS Utrecht	
10.20-10.40	Thresholds for the perception of translation to quantify and localize vestibular deficits Maurice Janssen, <i>Martijn Wolters, Herman Kingma</i> Academisch Ziekenhuis Maastricht	
10.40-11.00	An irrelevant tone can influence peri-saccadic mislocalisation Femke Maij, <i>Eli Brenner, Jeroen B.J. Smeets</i> Vrije Universiteit Amsterdam, Bewegings wetenschappen	
11.00-11.30	koffie en thee break, poster inspectie	
	parallele sessie 2 (kantine): Auditief	parallele sessie 3 (ontvangstruimte): Visueel I
11.30-11.45	Estimating speech intelligibility in quiet and noise with a cochlear-compression model Johannes Lyzenga, <i>Koenraad S. Rhebergen</i> KNO/Audiologie Vumc	Saliency effects are short-lived Mieke Donk <i>Wieske van Zoest, Leroy Soesman</i> Vrije Universiteit Amsterdam, Cognitive Psychology
11.45-12.00	Haptic search for shapes Myrthe A. Plaisier, <i>Wouter M. Bergmann Tiest, Astrid M.L. Kappers</i> Universiteit Utrecht	3D vorm waarneming in context Katinka van der Kooij <i>Susan te Pas</i> Helmholtz Instituut, Universiteit Utrecht
12.00-12.15	The benefit obtained from textual output of an Automatic Speech Recogniser during speech comprehension in noise Adriana Zekveld, <i>Sophia Kramer, Judith Kessens, Marcel Vlaming, Tammo Houtgast</i> VUMC	Interactive exploration of 3D objects and individual differences in visuo-spatial abilities Frank Meijer <i>Egon L. van den Broek, Willem B. Verwey</i> Universiteit Twente
12.15-12.30	A comparison between interaural level difference and interaural correlation uncertainty on binaural signal detection thresholds Nicolas Le Goff, <i>Armin Kohlrausch, Jeroen Breebaart</i> Eindhoven University of Technology	Priming effects on visual classification Mijke Hartendorp, <i>Stefan van der Stigchel, Hollie Burnett, Tjeerd Jellema, Albert Postma</i> Universiteit Utrecht
12.30-14.00	Lunchbroodjes tussen posters en demo's	
	parallele sessie 4 (kantine): Visueel II	parallele sessie 5 (ontvangstruimte): Multimodaal en Haptisch

	parallele sessie 4 (kantine): Visueel II	parallele sessie 5 (ontvangstruimte): Multimodaal en Haptisch
14.00-14.15	Ironic effects in penalty shooting: Avoid the to-be-avoided! Olaf Binsch, Raoul R. D. Oudejans, Frank C. Bakker, Geert J. P. Savelsbergh Research Institute Move, Faculty of Human Movement Science, VU University Amsterdam	Auditory capture during focused visual attention Thomas Koelewijn Adelbert Bronkhorst, Jan Theeuwes Vrije Universiteit Amsterdam
14.15-14.30	Gaze in Action and Perception Hemke van Doorn, John van der Kamp, Geert Savelsbergh VU Amsterdam	Ontwerp voor een multimodale systeem-intuïtie Roger Lenoir, Gerard van Wolfereen HKU
14.30-14.45	Effects of horizontal and vertical Field-of-View restriction on manoeuvring through complex structured environments Sander E.M. Jansen Alexander Toet, Nico J. Delleman TNO Defensie en Veiligheid	Emotional responses to color and texture Nikolaj Groeneweg, Marcel Lucassen, Theo Gevers University of Amsterdam
14.45-15.00	Subjective evaluation of enhanced imaging systems Ronald Kaptein, Pieter Seuntiëns, Ingrid Vogels, Ingrid Heynderickx - Philips Research Eindhoven Philips Research Eindhoven	Auditory-Visual Visual-Tactile Temporal Recalibration and the Effect of Spatial Disparity Mirjam Keetels, Jean Vroomen Universiteit Tilburg
15.00-15.15	Experimental test of visuomotor updating models that explain mislocalization of saccadic gaze shifts John van Opstal Radboud UMC	Synergy effects with mobile (audio and) video telephony Annemiek van Drunen, Frans van der Sluis and Egon L. van den Broek University of Twente
15.15-15.30	A cockpit display with two depth layers: visual search and attentional segregation F.L. Kooi, M. Kahrmanović, J.W.A.M. Alferdinck TNO Defensie en Veiligheid	Lipread induced recalibration of phonetic categories: 'Speech mode' vs. 'Non-speech mode'. Martijn Baart, Jean Vroomen Universiteit Tilburg
15.30-16.00	koffie en thee break, nabeschouwing posters	
	plenaire sessie 7 (kantine)	
16.00-16.20	Optic flow induced self-tilt perception Jelte Bos TNO Defensie en Veiligheid	
16.20-16.40	Haptische waarneming van indrukbaarheid Wouter M. Bergmann Tiest, Astrid M. L. Kappers Helmholtz Instituut, Universiteit Utrecht	
16.40-17.00	Audiovisual integration of saccade initiation in a complex scene Marc van Wanrooij Radboud UMC	
17.00-18.00	Afsluitend woord en borrel	