

## **Spatial Networks, Violence and Strategic Centrality**

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A global, spatial network of cities shows a clear pattern when contrasted with data sets of human violence: regions of the world with below a certain value of 'strategic centrality' (a topological quantity) are almost invariably safe, while areas above this threshold are at high risk of experiencing prolonged conflict of some kind. This signal appears robust and not due to some spurious effect, such as strategic centrality being a proxy for other societal variables, and therefore suggests the existence of an underlying mechanism which affects the probability of conflict. To investigate this we adapt an agent-based model of cities which influence each other (this could be militarily, culturally, etc.) and find that an analogous threshold behaviour is reproduced in the model. The explanation comes down to the existence of nodes which tend to lie at the boundaries of the network community structure, and which are most likely to find themselves torn between competing effects (e.g. different governments or cultural influences). I will describe this work, and the many questions it opens for further research and our understanding of conflict.

Weisi Guo, Xueke Lu, Guillem Mosquera Donate, and Samuel Johnson, "The Spatial Ecology of War and Peace", arXiv:1604.01693