

# Community Detection in a Large Collaboration Network of Nanotechnology Researchers

Scott Cunningham\* and Jan Kwakkel

*\*s.cunningham@tudelft.nl*

Delft University of Technology (Netherlands)

Why do certain authors collaborate with others? In truth, there is a strong place-based logic to collaboration. This is part of the Dutch school of geography, where it is known as “systemic” proximity. In this paper we take a complete data set of nanotechnology collaborations from the Web of Science. We map collaborations between and within European cities, and we geolocate the cities. Using a “modularity score” approach we detect communities in the social network. Having found the communities we create a geographical overlay of core collaboration basins on top of a European map. We then attempt to explain each of the basins. The paper concludes with a set of explanatory and policy-related questions. Do historical-geographical factors, linguistic factors, or political factors best explain the observed collaboration basins? What sorts of policies can facilitate out of community collaboration?