

Impact of motif content on dynamic function of complex networks

Initiative: Modellierung und Simulation komplexer Systeme (beendet)

Ausschreibung: Komplexe Netzwerke als fächerübergreifendes Phänomen

Bewilligung: 29.03.2007

Laufzeit: 3 Jahre

Network motifs are groups of few nodes with a specific link pattern. The dynamic performance of a network depends significantly on the types and numbers of motifs. In this project the link between the motif composition and dynamic performance of a network is studied by (i) developing new methods for systematically varying the motif content, (ii) simulating simple dynamic processes and evaluating the resulting performance, and (iii) attempting to observe motif-dependent dynamic function of networks in three case studies. These test cases are: metabolic networks (re-organization of metabolic fluxes after a topological perturbation), the network of long-distance train connections (size of delay cascades), and coauthorship networks (a publication's impact as a function of its authors constellation).

Projektbeteiligte

Prof. Dr. Marc-Thorsten Hütt

Constructor University
Department of Life Sciences and Chemistry
Computational Systems Biology
Bremen

Prof. Dr. Karsten Weihe

Technische Universität Darmstadt
FB Informatik
Fachgebiet Algorithmik
Darmstadt

Prof. Dr. Matthias Müller-Hannemann

Universität Halle-Wittenberg
Naturwissenschaftliche Fakultät III
Institut für Informatik
Halle (Saale)

