BIOGRAPHICAL SKETCH

Provide the following information for the key personnel and other significant contributors in the order listed on Form Page 2.
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NAME	POSITION TITLE
Sporns, Olaf	Professor, Associate Chair Department of Psychological and Brain Sciences
eRA COMMONS USER NAME osporns	

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	YEAR(s)	FIELD OF STUDY
Universitat Tubingen (Vordiplom)	B.S.	1986	Biochemistry
Rockefeller University	PhD	1990	Neuroscience
Neurosciences Institute	Post Doc	1990-1994	Theoretical Neuroscience

A. Personal Statement

One of the central aims of the proposed project is to identify the network substrates of functional brain network recovery. My experience in graph-theoretic analyses of network organization is central to this effort. For more than a decade, I have developed and applied network analysis tools in the context of neuroscience, particularly to large-scale networks derived from both diffusion MRI and resting-state fMRI. Over the years, I have engaged in a number of collaborative projects with researchers in brain imaging and computational neuroscience, which have resulted in several peer-reviewed publications. Individual variations in brain networks and their disturbance in the course of brain dysfunction and brain injury are at the core of my current research interest, and I will dedicate a significant portion of my research effort to study mechanisms of network recovery in this context.

B. Positions and Honors

Positions and Employment

1990-1994 Institute Fellow in Theoretical Neurobiology, The Neurosciences Institute, New York, NY.
1994-2000 Senior Fellow, The Neurosciences Institute, La Jolla, CA.
2000-2004 Assistant Professor, Department of Psychology, Indiana University.
2004-2007 Associate Professor, Department of Psychology, Indiana University.
2007- Professor, Department of Psychological and Brain Sciences, Indiana University.
2001- External Research Professor, Krasnow Institute for Advanced Study, GMU, Fairfax, VA.
2004- Faculty, Parmenides Foundation, Munich, Germany.
2005- Associate Chair and Director of Undergraduate Programs, Department of Psychological and Brain Sciences, Indiana University.
2009- Adjunct Professor of Informatics, School of Informatics and Computing, Indiana University.

Other Experience and Professional Memberships

1991- Member, Society for Neuroscience
1992- Member, American Association for the Advancement of Science
1998- Member, International Society for Adaptive Behavior
2002- Member, Sigma Xi
2001- Associate Editor, *BioSystems*.
2002- Editorial Board Member, *Neuroinformatics*.
2003- Associate Editor, *International Journal of Humanoid Robotics*.
2004- Associate Editor, *Adaptive Behavior*.
2006- Editorial Board Member, *Cognitive Neurodynamics*.

2007- Associate Editor, *PLoS Computational Biology.*
2008- Section Editor for Computational Biology and Genomics, *PLoS ONE*
2005, 2006 Member, NIH/NSF Collaborative Research in Computational Neuroscience Panel.
2005, 2006 Temporary Member, NIH COG Panel.
2005-2006 Member, European Community, FP7 Advisory Panel
2008- Governing Board, International Conference on Development and Learning

Honors

2002 Outstanding Paper Award, International Conference on Development and Learning '02, MIT.
2002 Outstanding Junior Faculty Award, Indiana University Bloomington.
2004 Trustees Teaching Award, Indiana University Bloomington.
2008 Distinguished Faculty Award, College of Arts and Sciences, Indiana University.

C. Selected Peer-Reviewed Publications (selected from a total of 110 publications)

Most Relevant to the Current Application

Rubinov, M, **Sporns, O** (2010) Complex network measures of brain connectivity: Uses and interpretations. Neuroimage, http://dx.doi.org/10.1016/j.neuroimage.2009.10.003. PMID: 19819337

Honey,CJ, **Sporns, O** Cammoun L, Gigandet X, Thiran JP, Meuli R, Hagmann P (2009) Predicting human resting-state functional connectivity from structural connectivity. *Proc. Natl. Acad. Sci. USA* 106, 2035-2040. PMCID: PMC2634800

Bullmore, E.T, **Sporns, O**. (2009) Complex brain networks: graph-theoretical analysis of structural and functional systems. *Nature Reviews Neuroscience* 10, 186-198. PMID: 19190637

Hagmann, P., Cammoun, L., Gigandet, X., Meuli, R., Honey, C.J., Wedeen, V.J., **Sporns, O.** (2008) Mapping the structural core of human cerebral cortex. *PLoS Biology* 6, e159. PMCID: PMC2443193

Sporns, O., Honey, C.J., and Kotter, R. (2007) Identification and Classification of Hubs in Brain Networks. *PLoS ONE* 2, e1049. PMCID: PMC2013941

Additional Recent Publications of Importance to the Field (in reverse chronological order)

Alstott, J, Breakspear, M, Hagmann, P, Cammoun, L, **Sporns, O** (2009) Modeling the impact of lesions in the human brain. PLoS Comput Biol 5, 1000408. PMCID: PMC2688028

Rubinov, M, **Sporns, O**, van Leeuwen, C, Breakspear, M (2009) Symbiotic relationship between brain dynamics and architectures. BMC Neuroscience 10, 55. PMCID: PMC2700812

Deco, G, Jirsa, V, McIntosh, AR, **Sporns, O**, Kötter, R (2009) Key role of coupling, delay, and noise in resting brain fluctuations. Proc. Natl. Acad. Sci. USA 106, 10302-10307. PMID: 19497858

Honey, CJ, **Sporns, O** (2008) Dynamical consequences of lesions in cortical networks. *Human Brain Mapping* 29, 802-809. PMID: 18438885

Honey, C.J., Kötter, R., Breakspear, M., **Sporns, O.** (2007) Network structure of cerebral cortex shapes functional connectivity on multiple time scales. *Proc. Natl. Acad. Sci. USA* 104, 10240-10245. PMCID: PMC1891224

Lungarella, M., and **Sporns, O.** (2006) Mapping information flow in sensorimotor networks. *PLoS Comp. Biol.* 2, 1301-1312. PMCID: PMC1626158

Sporns, O., Tononi, and Kötter, R. (2005) The human connectome: A structural description of the human brain. *PLoS Computational Biology* 1, 245-251. PMCID: PMC1239902

Sporns, O., and Kötter, R. (2004) Motifs in brain networks. *PLoS Biology* 2, 1910-1918. PMID: 15510229

Sporns, O., Chialvo, D., Kaiser, M., and Hilgetag, C.C. (2004) Organization, development and function of complex brain networks. *Trends in Cognitive Sciences* 8, 418-425. PMID: 15350243

Sporns, O., and Zwi, J. (2004) The small world of the cerebral cortex. *Neuroinformatics* 2, 145-162. PMID: 1519512

D. Research Support

Ongoing Research Support

220020082 (PI: A. Randall McIntosh) 09/01/05 – 11/30/10 30%
JS McDonnell Foundation $4,100,000
Network Mechanisms Underlying Cognition and Recovery of Function in the Human Brain
This project will combine computational, cognitive and clinical studies on normal brain function and functional recovery after brain injury. Major goals are to develop and apply quantitative tools to analyze brain dynamics and to employ network modeling to plot novel strategies for brain repair and functional recovery.
Role: Co-I.

FA9550-09-1-0665 (PI: C. Yu) 09/30/09 – 09/30/11 20%
Air Force Office of Scientific Research $450,000
An Information-Theoretical Approach to Coordinated Behavior
The project involves the design and testing of objective metrics based on information theory, in the context of coordinated behavior, e.g. between infants and parents. These metrics will be used to detect coupling of sensorimotor variables, indicative of coordination, for example during word learning.
Role: Co-I

0834227 (PI: R. Beer) 01/01/10 – 12/31/14 8% (1.0 cm)
National Science Foundation $3,124,368
IGERT: The Dynamics of Brain-Body-Environment Systems in Behavior and Cognition
The goal of the program is to train doctoral students to think across traditional levels of analysis in the cognitive, behavioral and brain sciences. In order to accomplish these goals, we have developed new courses in situated, embodied and dynamical cognitive science, a professional development seminar, summer research internships, an annual research showcase and a colloquium series offering extended opportunities for trainees to interact with visiting speakers.
Role: Co-PI, Executive Committee (Member), Education and Training Committee (Chair)

Pending

NIH Blueprint RFA: Human Connectome Project
(PI: D. Van Essen, K. Ugurbil) 07/01/10 – 06/30/15 15%
National Institutes of Health
Mapping the Human Connectome: Structure, Function, and Heritability
This project will aim at mapping anatomical and functional networks of the normal adult human brain. Data will also be acquired that will characterize human behavior and genotypes. All data will be shared publicly and data sets, models, and analysis tools will be shared with the broader neuroscience community.
Role: Co-I, Operations Committee (Member), Optimization Team 6: Cross-Modal Integration and Network Modeling (Chair)