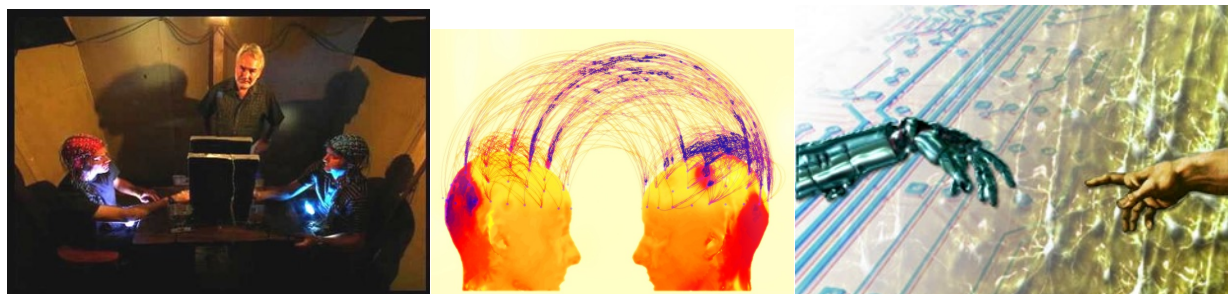


From Social Distancing to Social Harmony




The deep irony of ‘social distancing’ is that it is a force that is bringing people closer together. A common experience is that “I was never so connected with my family and friends all over the world”. Outside of the technology that makes it possible, what is behind this feeling of social harmony? And why is it important to understand? Over the last 15 years, scientists in the Human Brain & Behavior Laboratory at FAU’s Center for Complex Systems and Brain Sciences—the first Center of its kind in the Nation by the way—have used high-resolution brain imaging and sophisticated computer analysis to uncover basic neural mechanisms underlying social interaction. By means of an intimate interplay between experiments on people interacting with each other in real time (left), sophisticated computer analysis of their brain signals (middle) and virtual partners controlled by the equations of Coordination Dynamics (right), they have identified “neuromarkers” for the diagnosis and treatment of neuropsychiatric disorders as well as significantly advanced our understanding of social harmony.

Understanding how coordination occurs both within the human brain and between human brains is vital for a lot of reasons. Ways to enhance coordination with others can help prevent diseases like depression and Alzheimer’s which are often accompanied by social isolation and loneliness. Moreover, the breakdown of neural coordination is thought to lie at the heart of major neuropsychiatric disorders such as schizophrenia and autism. Solving the coordination problem in such a complex system stands to pay big time dividends, in terms of boosting individual and social productivity, reducing health care costs and alleviating human suffering. *You can see how important coordination is when people are forced to ‘socially distance’. In the current crisis, the word “coordination” comes up all the time. It reflects how closely people, things and events are connected. But coordination is a bit like gravity: we take it for granted. Only when it breaks down does it become obvious how synergized the world is at every scale. Everything, it seems, depends on everything else. When things are not coordinated, chaos reigns. Markets can fold.* The “new” science of coordination called Coordination Dynamics has attracted scientists and practitioners around the world. Its birth began at FAU as a unique interdisciplinary initiative among a small group of scientists who continue to develop it here.

Background References

Oullier, O., DeGuzman, G.C., Jantzen, K.J., Lagarde, J., & Kelso, J.A.S. (2008) Social coordination dynamics: Measuring human bonding. *Social Neuroscience*, 3, 178-192.

DOI:10.1080/17470910701563392 

Kelso, J.A.S. (2009). Coordination Dynamics. In R.A. Meyers (Ed.) *Encyclopedia of Complexity and System Science*, Springer: Heidelberg (pp. 1537-1564).

Tognoli, E., Lagarde, J., DeGuzman, G.C., & Kelso, J.A.S. (2007) The phi complex as a neuromarker of human social coordination. *Proceedings of the National Academy of Sciences*, 104, 8190-8195 (from the cover; see also *Scientific American Mind*, August, 2007).

Dumas, G., DeGuzman, G.C., Tognoli, E. & Kelso, J.A.S. (2014) The Human Dynamic Clamp as a paradigm for social interaction. *Proceedings of the National Academy of Sciences*
<http://www.pnas.org/cgi/doi/10.1073/pnas.1407486111>

Dumas, G., Moreau, Q., Tognoli, E., & Kelso, J.A.S. (2019). The Human Dynamic Clamp reveals the fronto-parietal network linking real-time social coordination and cognition (bioRxiv May 27, 2019 651232) *Cerebral Cortex*, 23 December, 2019. <https://doi.org/10.1093/cercor/bhz308>