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Modeling, Inference, and Prediction From Vector Time-Series

Abstract:

The unprecedented real time access to large volumes of multimodal data, is the consequence of proliferation of embedded sensors in commercial, military naval, ground and aerial devices. This talk reviews our current research on processing of the information content of multimodal data. We have been developing algorithms for representing, modeling, processing, and communicating information that are adaptive and robust to dynamic changes in environment, scalable to many distributed signal processing agents and their resources, and able to predict and learn from experience.

I will also argue that the traditional computing and communications methods must be revisited given new challenges posed by ever growing massive data. Additionally, some new fundamental limits of information and learning from multimodal data must be established which must depend on the objectives, capabilities, etc. of the learner.

Bio:

Vahid Tarokh is a Professor of Applied Mathematics, Senior Research Fellow in Electrical Engineering and a member of Center for Mathematics and Applications at Harvard University. His main current research interests are in applied and computational mathematics. In the past, he has published on Lie groups and algebras, lattices, graphical models, pseudo-randomness, information theory, random matrix theory, coding, communications, pricing and scheduling, statistical signal processing (including adaptive algorithms) and applications (e.g. MRI and EEG signal processing), radar and distributed astronomy. He has been selected as a Guggenheim Fellow in Applied Mathematics (for his work on random and pseudo-random matrices), and has received three honorary degrees.