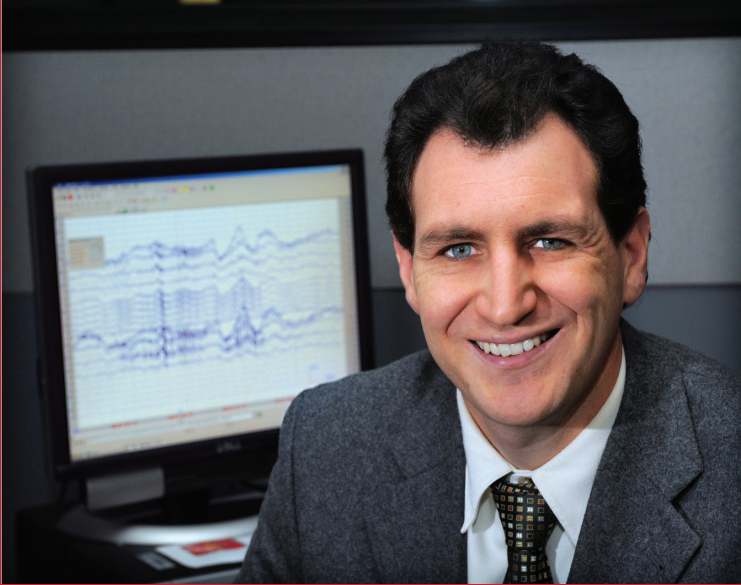


ECE Chair's Seminar

Friday, Oct. 13

1 p.m.

3043 ECpE Building Addition



Robi Polikar: Professor and Department Head of Electrical and Computer Engineering at Rowan University

Learning in Nonstationary Environments under Extreme Verification Latency; and, Engineering Clinics — An Alternative to Senior Design

ABSTRACT: In the first half of this lecture, I will introduce COMPOSE, a density tracking framework for

learning from nonstationary streaming data, where labels are never available for the streaming data after initialization. We will discuss the algorithm in detail, as well as its verification on several carefully designed synthetic and real-world data. We will show that the algorithm is really a modular framework, whose individual components can be suitably modified to solve a variety of problems associated with nonstationary environments. On the departmental administration side, I would like to describe a unique curricular mechanism that has proven to be extraordinarily successful for us. Senior / Capstone Design, a common class in most engineering programs, provides students with an opportunity to put their cumulative knowledge and skills to good use for solving real-world problems. Typically, students propose a project or choose from a list of pre-approved projects, work on their design to solve the underlying problem, and present their findings. Yet, actual implementations of senior design are often riddled with a variety of challenges. If the projects are pre-selected by faculty, they are often limited in number and scope to be within the expertise of one (or few) instructor(s) responsible for the class. If the students pick the projects, there is a wide spread in the technical rigor of the projects. Often all students within a project are from the same discipline, with little or no opportunity to work in truly multidisciplinary teams. Finally, senior design is, well, limited to seniors, and preclude other students from participating in such a design experience. At Rowan Engineering, we challenge the notion that capstone design can only be during the final year of the program, or can only run within a department, or taught by only a few faculty members. In fact, we do not even have senior or capstone design. Instead, we have an eight-semester sequence, called Engineering Clinics & Clinic Consultant, in which students work on increasingly sophisticated real world projects, in truly inter and multidisciplinary teams spanning all departments of the College. During the four semesters of junior and senior years, students work on not just real-world problems, but “unsolved” problems, often presented by industry and/or drawn from active research projects of the faculty. Not only any given project may have students from across the college – depending on the expertise needed by the project – juniors and seniors (and sometimes even sophomores or graduate students) participate in any given project, providing both horizontal and vertical integration. Students may propose their own projects, but the same rigor of “unsolved real-world problem” standard is applied to those projects as well. Students are required to participate in at least one “out-of-discipline” project experience, and perhaps more interestingly, all – not just a few – engineering faculty are involved in the clinics.

BIO: Robi Polikar is a Professor and Department Head of Electrical and Computer Engineering at Rowan University, in Glassboro, NJ. He received his B.Sc. degree in electronics and communications engineering from Istanbul Technical University in 1993, and his M.Sc and Ph. D. degrees, both co-majors in electrical engineering and biomedical engineering, from Iowa State in 1995 and 2000, respectively – having spent many happy years within the walls of Durham Center, Coover Hall, and Vet Med. During his ISU years, Robi was also involved in Orchesis I and II, the two campus dance organizations, through which he performed everything from ballet to modern dance on the stages of Stephens Auditorium, Fisher's Theater, M-shop at the Memorial Union, and the atria of countless academic buildings. He has been with the Electrical and Computer Engineering at Rowan since 2001. His current research interests include ensemble systems, incremental and nonstationary learning, and various applications of machine learning in bioinformatics and biomedical engineering. His work has continuously been funded by NSF starting with a 2003 CAREER award. He has served as an Associate Editor for IEEE Transactions on Neural Networks and Learning Systems and Springer's Evolving Systems. He is also an ABET evaluator for Engineering Accreditation Commission. He is actively involved with the Computational Intelligence Society of IEEE, serving as the chair of the Data Mining and Big Data Technical Committee.

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