Prof. Djuric receives European Technical Achievement Award

Prof. Petar M. Djuric has recently received the Technical Achievement Award given by the European Association for Signal Processing for “contributions to the theory and application of Monte Carlo-based methods in signal processing.”

Prof. Djuric’s work involves advanced computational methods for extracting information from signals. Signals are carriers of information about phenomena from the physical world, and they come in various forms including audio, radio, and light signals. The extraction of information from signals is carried out by signal processing, and the types of information that is extracted range from digital information to whether signals are present at a receiver (i.e., detection) to how many signals are present to tracking and location information to voice and image recognition. Signal processing enables many well-known technologies including cell phones, video communication, diagnostics in medicine (e.g., it is used in processing of EKGs, EEGs, and MR imaging), GPS, radar, and sonar.

The Monte Carlo methods that Prof. Djuric is cited for are computational algorithms for detection and estimation of signals that are based on the use of computer-generated random numbers. The use of Monte Carlo methods goes back to the Manhattan project of World War II, and currently, they are an indispensable tool in many fields including physics, astronomy, econometrics, biology, and engineering. While many simpler problems in signal processing have been solved by analytical approaches, the much more challenging complex problems characterized by non-linear and non-standard statistical assumptions and by the complexity of the information can only be addressed by computational methods. Prof. Djuric and his Ph.D. students have worked on Monte Carlo-based methods for more than ten years. Prof. Djuric also teaches courses on stochastic (random) signals and systems, and signal detection and estimation in the ECE department. Prof. Djuric is a Fellow of the IEEE.

The Technical Achievement Award will be presented to Prof. Djuric at EUSIPCO 2012 in Bucharest, Romania.

![Diagram](image-url)

Learning the space of an unknown parameter by using random sampling. The objective is to find the parts of the space with large probability masses. The solid lines represent probability densities, and the circles are samples (particles) of the unknown parameter. The radii of the circles are proportional to the weights assigned to the particles.