

Random Data Sizes for Decisions and Monitoring

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Abstract

In many applications, it is required to make decisions that are based on available data. In this presentation, we will discuss the possibility of data where their number is not fixed (as is the typical case) but it is being selected automatically, by the data themselves, during the acquisition process. To demonstrate the usefulness of this idea we will apply it to the Record Linkage problem in databases and we will see that it can produce significant gains in the number of comparisons needed to complete the corresponding task. As a second example, the concept of random data sizes will be used in the Multi-Armed Bandit problem (which constitutes an integral part of Reinforcement Learning). In this case, we will argue why we expect this idea to be beneficial for the overall performance, leading also to a tractable form for the final optimum solution. In the second part of our presentation we will focus on the Monitoring problem where random-sized data are inevitable. We will very briefly present existing popular monitoring techniques and introduce long standing open challenges. In particular, we will describe the crucial issue of data modeling and how it can be efficiently addressed by adopting specially designed Generative Adversarial Networks (GANs)

Bio

George Moustakides received the diploma in Electrical and Mechanical Engineering from the National Technical University of Athens, Greece, in 1979, the MSE in Systems Engineering from the Moore School of Electrical Engineering, University of Pennsylvania, Philadelphia, in 1980, and the M.Sc and Ph.D in Electrical Engineering and Computer Science from Princeton University, Princeton NJ, in 1983.

During 1983-1986 he held a Junior Researcher position with INRIA, France, then a Researcher position (1988-1991) with the Computer Technology Institute of Patras, Greece. In 1991 he joined the Computer Engineering and Informatics department, University of Patras, Greece as Associate Professor

and became Full Professor in 1996. From 2001 to 2004 he was with INRIA, France as Senior Researcher (research group leader) and during 2001-2007 he was also a Professor with the University of Thessaly, Greece. In 2007 he joined the department of Electrical and Computer Engineering, University of Patras, Greece until 2017. Since Fall 2017 he is Professor of Practice with the Computer Science department, Rutgers University.

Prof. Moustakides also held numerous appointments, financed by the hosting institutes, as Visiting Scholar and/or Adjunct Professor with Princeton University, University of Pennsylvania, Columbia University, University of Maryland, Georgia Institute of Technology, University of Southern California, University of Illinois at Urbana-Champaign and Rutgers University (Business School, CS and ECE).

His interests include Sequential Decision Making, Statistical Signal Processing and, during the recent years, Machine & Reinforcement Learning.

From 2011 to 2014 he served as Associate Editor for Detection and Estimation and from 2016 to 2020 as inaugural Associate Editor for Sequential Methods for the IEEE Transactions on Information Theory.

Faculty Host: Matthew Stone