



Trinity College Dublin
Coláiste na Tríonóide, Baile Átha Cliath
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Prediction-Correction Methods for Time-Varying Convex Optimization: theory, algorithms, applications

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Abstract: Several dynamic estimation, control, and signal processing problems can be formulated as optimization programs, whose objective functions change continuously in time. One could sample the objective functions at different discrete sampling instances and then solve the resulting time-invariant optimization programs. However, if the requirements on sampling period are too stringent- or if the problem is of large-scale nature- one cannot solve each instance of the time-varying program exactly per time step. In this talk, I will overview some recent results in the context of prediction-correction algorithms that can be used to iteratively solve time-varying optimization programs and track their solution trajectories as time passes, without solving each program instance. I will touch upon the underlying theoretical ideas, simulation results, and decentralized implementations for distributed time-varying optimization. The presentation's main content is based on two recent works [arXiv:1509.05196],[arXiv:1602.01716], yet some ongoing research effort concerning the extension of the above algorithms to constrained problems, as well as general convex optimization will be overviewed. A glimpse of a possible societally-relevant application will be given [arXiv:1601.07263], in the context of time-varying problems in smart grids.

Short Bio: Andrea Simonetto received the M.Sc. degree in space engineering (cum laude) from both Politecnico di Milano and Politecnico di Torino, Italy, in 2008, and the Ph.D. degree in systems and control from the Delft University of Technology, Delft, The Netherlands, in 2012. He is currently a Post-Doctoral Researcher with the ICTEAM institute, at Universite Catholique de Louvain, Belgium. He was a Post-Doctoral Researcher with the Electrical Engineering Department, at Delft University of Technology, and a visiting researcher with the Robotics Institute, Carnegie Mellon University, Pittsburgh, PA, USA, with KTH, Royal Institute of Technology, Stockholm, Sweden, and with University of Pennsylvania, Philadelphia, PA, USA. His current research interests include distributed estimation, control, and optimization with applications in sensor networks and mobile robotics. For his Ph.D. work, he was awarded the DISC Ph.D. Thesis award 2013.

Venue: Large Conference Room, O'Reilly Institute.

Further Details: <http://www.scss.tcd.ie/doug.leith/seminars.php>