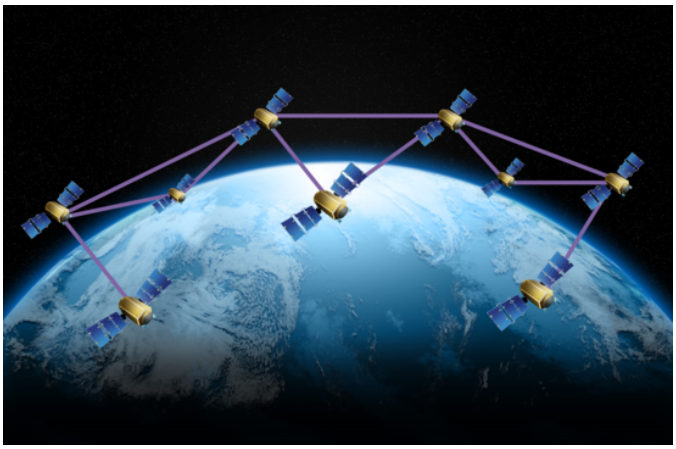

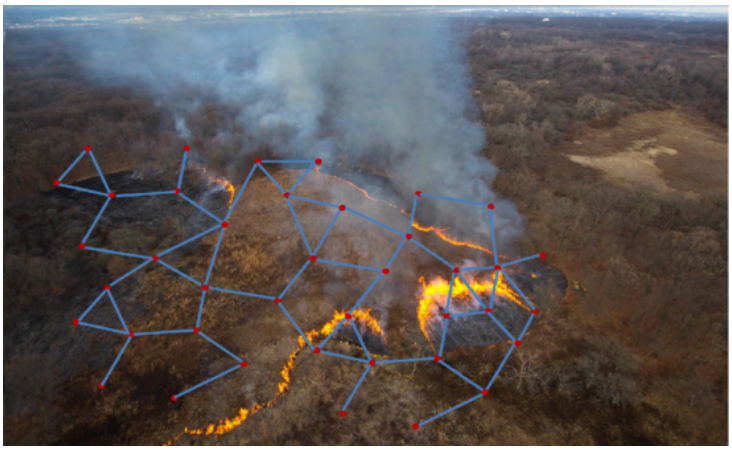

An intrinsic aspect of the world around us is the existence of complex networks such as biological, chemical and social networks, and our technological world contains many designed networks such as the internet, power grids, and robotic networks. Uncertainties in the environment often have a significant impact on the cost functions making it difficult to set up a tractable optimization problem. Despite its many successes, the stochastic optimization method fails at addressing the dynamic aspect of the problem. Online learning is an attempt to overcome this obstacle where the uncertainty in the system is demonstrated by an arbitrarily varying cost function. The cost function is unknown, even without probabilistic assumption, at the time the relevant decision is made. One standard metric to measure the performance of the online algorithms is called regret. Regret measures the difference between the incurred cost and the cost of the best fixed decision in hindsight. Consequently, a good algorithm is one that the average regret approaches zero.

Publications

- Saghar Hosseini, Airlie Chapman, and M. Mesbahi, "Online Distributed Estimation via Adaptive Sensor Networks," The IEEE Transactions on Control of Network Systems, 2013 (submitted)
- Airlie Chapman, Eric Schoof and Mehran Mesbahi, "Distributed Online Topology Design for Disturbance Rejection". In Proc. of the 52nd IEEE Conference on Decision and Control, 2013. (accepted)
- Saghar Hosseini, Airlie Chapman, and M. Mesbahi, "Online Distributed Optimization via Dual Averaging,". In Proc. of the 52nd IEEE Conference on Decision and Control, 2013. (accepted)