

ACM XRDS: Efficient Sensor Placement for Environmental Monitoring

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Sunday, 20 April 2014 02:21 - Last Updated Friday, 21 August 2015 15:01

The Spring 2014 issue of [XRDS: Crossroads](http://xrds.acm.org), the ACM magazine for students is about [cyber-physical systems](http://dl.acm.org/citation.cfm?id=2602518&dl=ACM&coll=DL&CFID=442640581&CFTOKEN=69531558).

My XRDS department contributed a column on [efficient sensor placement for environmental monitoring](http://dl.acm.org/citation.cfm?id=2602518.2591613&coll=portal&dl=ACM). The column is about an important problem of observation selection that received considerable research attention in recent years. Consider, for example, the air quality monitoring in a large research lab, the monitoring of algae biomass in a lake or the placement of a network of sensors in a water distribution system for early detection of contaminants. In all these settings we have to decide where to place the sensors in order to effectively collect information about the environment. Since acquiring observations is typically expensive and we have a limited budget, we want to select a small number of most informative locations for monitoring. Thus, we usually trade off the informativeness of sensor measurements for the cost of data acquisition. The column gives an example of large sensor deployment in a research lab and applies tools of submodular optimization to tackle the task effectively with some theoretical performance guarantees of near optimal observation selection.