advancing our capabilities
to acquire, extract, and
enhance information
from sensors and other
transducers
Signal Processing

Data Deluge
Accelerating Data Deluge

• **1.25 trillion gigabytes** generated in 2010
  - # digital bits > # stars in the universe
  - growing by a factor of 10 every 5 years
  - **fueled** by rapid growth of digital sensing/multimedia

• **Total data generated > total storage**

• Increase in **generation rate** > increase in **communication rate**
Exploiting Diversity and Specialization in Intelligent Systems via Adaptive Combination using machine learning to boost the performance of signal processing algorithms
Helmut Bolcskei

Managing Massive Interference

towards new communications technologies capable of carrying the data deluge
Martin Wainwright

Discovering and Exploiting Structure in High-Dimensional Data Sets

exploiting the wealth of available data to discover heretofore unknown structures
Emmanuel Candes

Compressive Sensing

radically new sensors enabled by randomization + optimization that compress as they sense