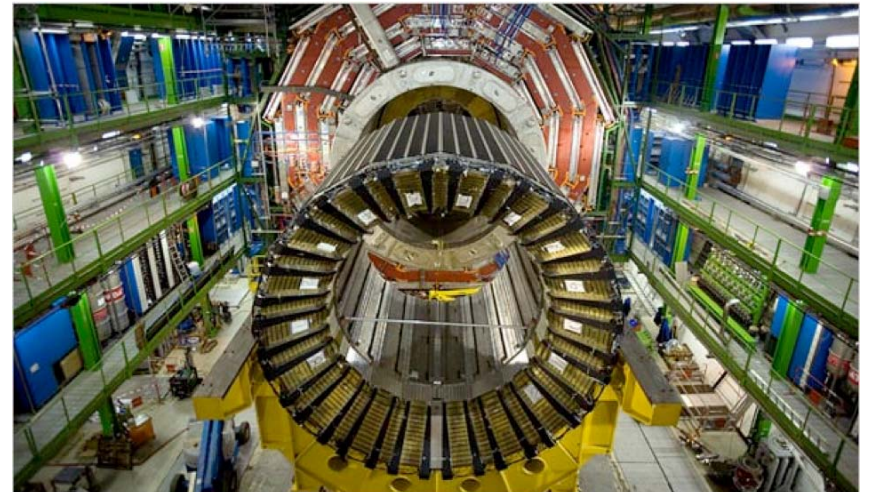


# Signal Processing

Mislav Grgic  
Richard Baraniuk

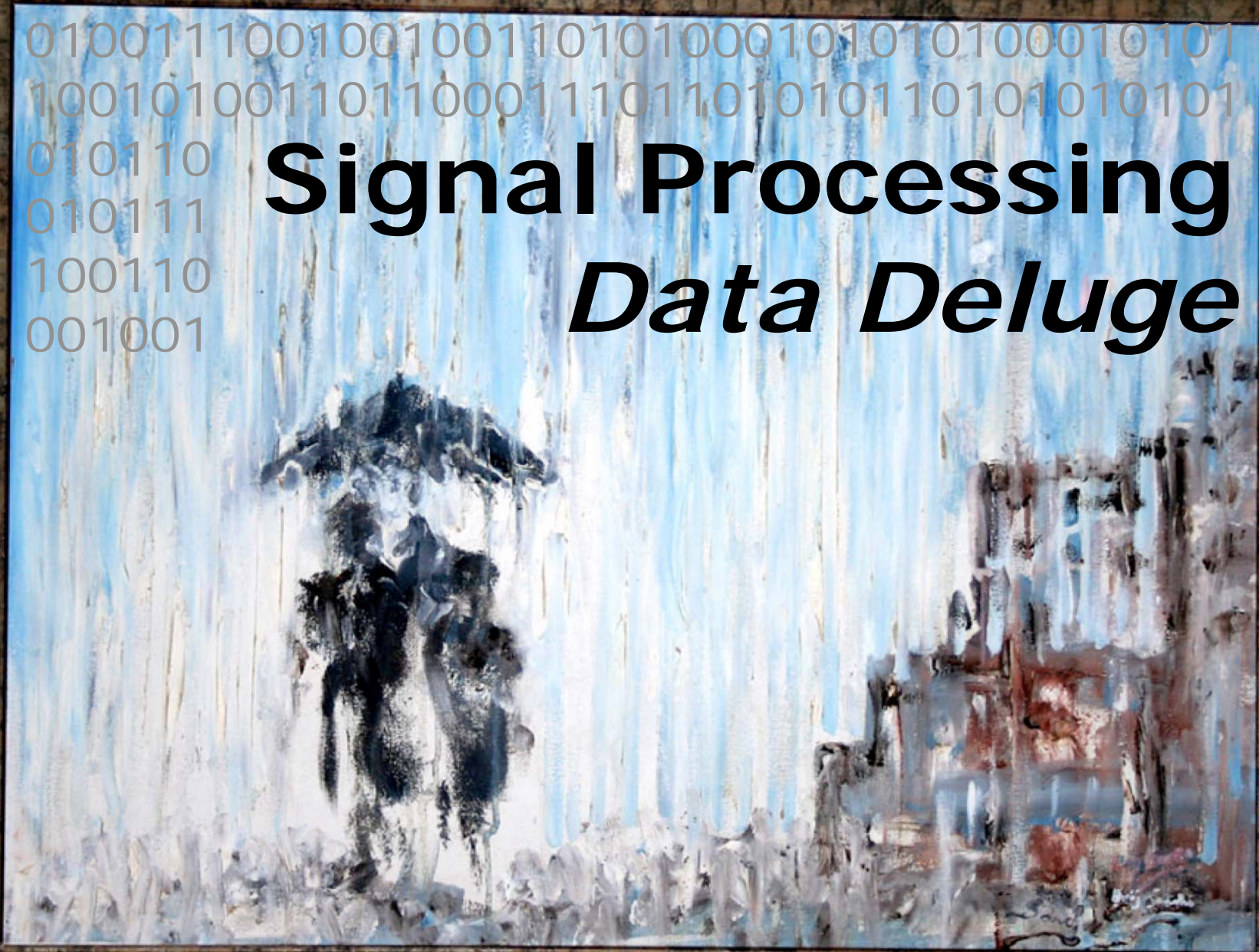
*advancing our capabilities  
to acquire, extract, and  
enhance information  
from sensors and other  
transducers*



010011100100100110101000101010100010101  
100101001101100011101101010110101010101  
010110  
010111  
100110  
001001

# Signal Processing

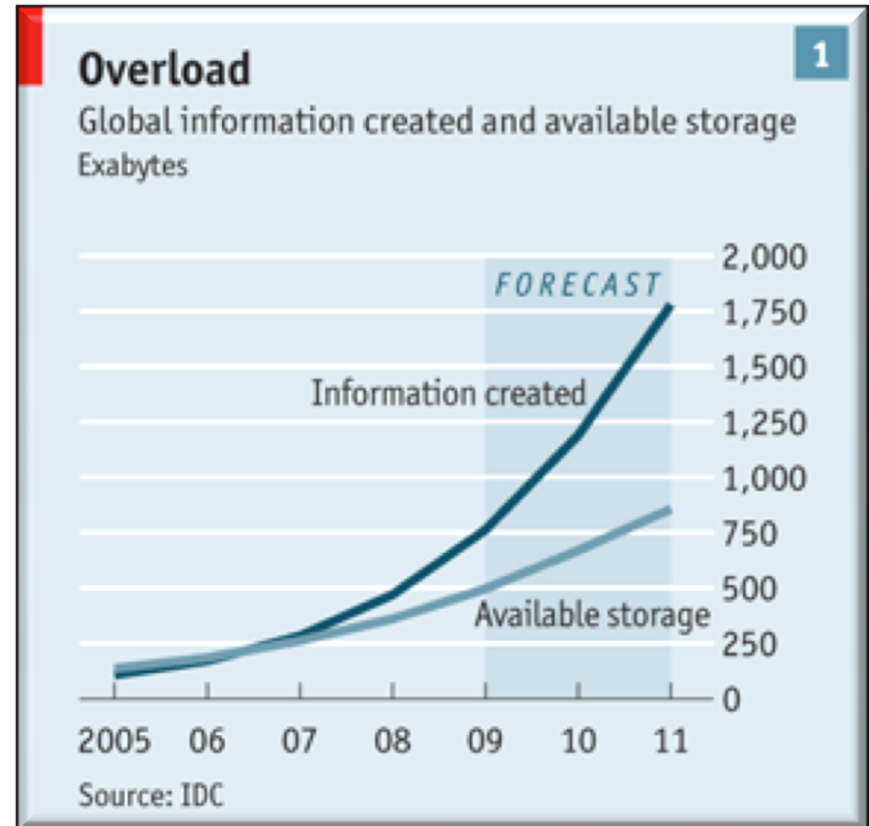
## *Data Deluge*



# 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**



# **Jerónimo Arenas-García**

*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