2020 Spring Retreat

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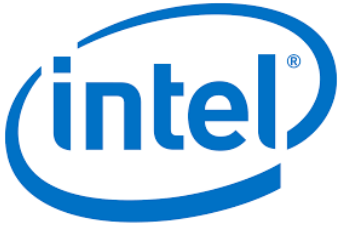


Platform Lab Faculty

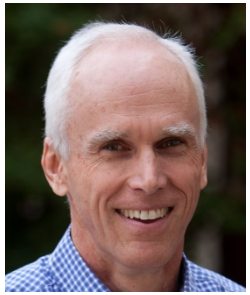
Bill Dally
Architecture

Sachin Katti
Networking

Christos Kozyrakis
Architecture,
System Software

Phil Levis
Embedded Systems

Nick McKeown
Networking



John Ousterhout
Granular Computing
(Faculty Director)

Guru Parulkar
Networking
(Exec. Director)

Balaji Prabhakar
Networking

Mendel Rosenblum
Distributed Systems,
Networking

Mac Schwager
Distributed
Robotics

Keith Winstein
Networking,
Granular Apps

Matei Zaharia
Big Data,
Cloud Computing

The Platform Lab is Five Years Old!

- **A good time to look backward:**
  - What did we hope to accomplish?
  - What have we done?
- **A good time to look forward:**
  - What's next?
  - What will be the same?
  - What will be different?

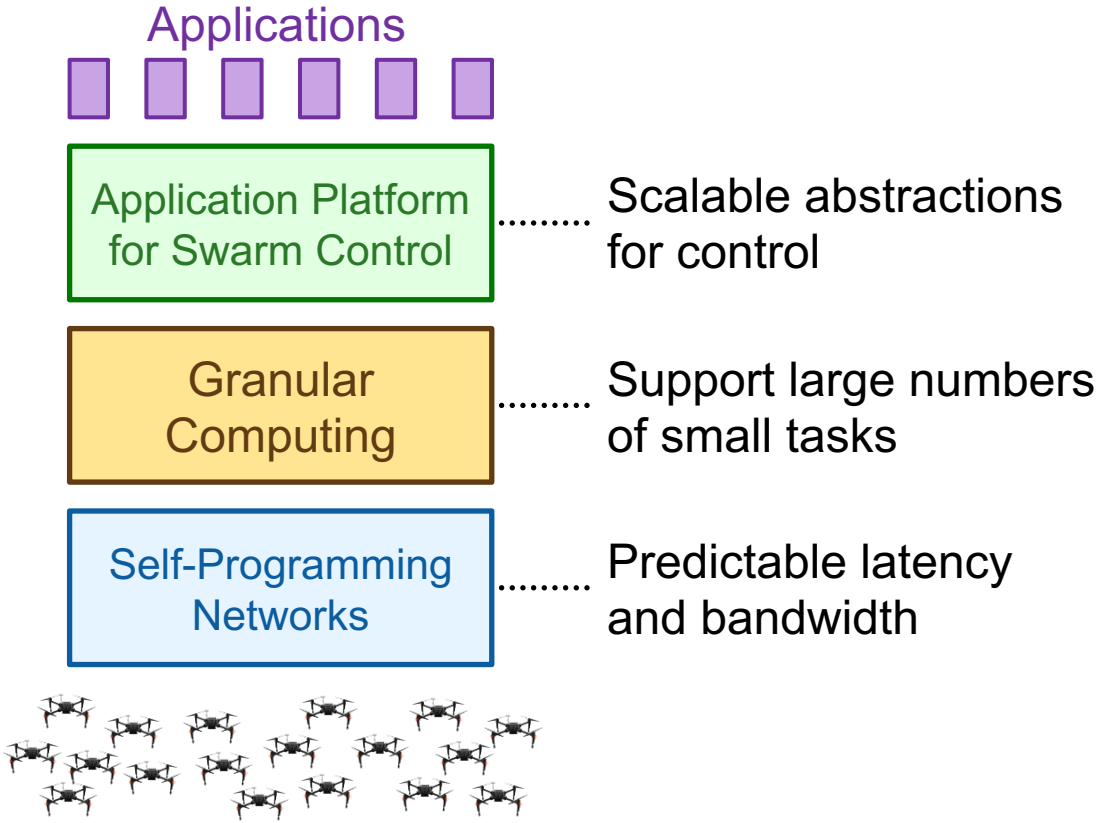
Lab mission:

define new hardware/software platforms

that enable exciting new classes of applications

Vision: Platforms for Swarm Control

- **Thousands or millions of devices**
  - Drones, self-driving cars, etc.
- **Managed centrally:**
  - 1000s of servers in a datacenter



Other Lab Goals

- **Greater mass of activities:**
  - More faculty than predecessor labs
- **Encourage collaboration**
- **Interact with a variety of companies**

Disappointments

- **NSF proposal on Swarm Control was not funded**
- **Application Platform for Swarm Control too aspirational**
  - Couldn’t find faculty/students with interests in both systems and robotics
- **Collaboration has been less direct than hoped**
  - No single project that everyone works on
  - Lots of cross-fertilization of ideas
  - Some smaller-scale collaborations, joint advising
  - Faculty interests/styles are very diverse

Successes

The Platform Lab vision is a good match to our work

- **Many smaller platforms instead of one all-encompassing one**
- **Greater mass:**
  - Faculty: 5 → 12
  - Affiliate companies: 7 → 14
- **Created an environment that encourages collaboration:**
  - Gates 3A renovation
  - Platform Lab Seminar
- **20–30 talented PhDs (and more to come)**
- **Unplanned surprises:**
  - Clock synchronization → time and its relationship to apps
  - Interplay between systems and machine learning

The Future of the Platform Lab

- **What will stay the same:**
  - Platform vision
  - 10-12 terrific faculty
  - Active engagement with industry
  - Practicality: systems that are not just interesting, but also useful
  - Lots of talented graduate students
  - Research results openly available
- **What will be different:**
  - Aspirational → practical
  - Realistic expectations about collaboration: embrace diversity of faculty interests
  - New themes:
    - Let interests drive the themes, not vice versa
    - Look for commonality in what we want to do

New Themes

- **Using Accurate Clocks for Powerful Solutions in Systems and Networking**
  - Event ordering/scheduling without global coordination
  - Deterministic and jitter-free systems
  - Large-scale monitoring and control using Time Perimeters
- **Systems and Machine Learning**
  - Better systems for machine learning applications
  - Using machine learning techniques to improve systems
- **SDNs: Continuing Evolution and Improvement**
  - E.g., using programmable forwarding for
    - Fine-grain measurement
    - Closed-loop control
    - Network verification
- **Expect other work as well (and surprises)**

Retreat Sessions

Tuesday, June 10	**2:00 – 5:15**	**Technical Talks/Discussion**
Thursday, June 11	**4:30 – 7:30**	**It's About Time! Talks/Panels**
Friday, June 12	**2:00 – 5:15**	**Technical Talks/Discussion**
Monday, June 15	**2:00 – 4:00**	**Student Posters**
	4:00 – 5:30	**Faculty Office Hours**

Questions/Discussion