Final session: Computing and Mathematical Sciences

Goal: An introduction to, advertisement for, & call for feedback on a new PhD program
Why start a new PhD program?
We are in the midst of an unprecedented convergence of disciplines:

- Operations Research
- Economics
- Statistics
- Computer Science
- Mathematics
- Electrical Engineering
- Control
- Operations Research
- Economics
- Neuroscience
- Medicine
- Psychology
- Biology
- Statistics
- Computer Science
A new core has emerged
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- Analytics
- Complex Systems
- Bioinformatics
- Big Data
- Data science
- Computer Science
- Statistics
- Math
- Electrical Engineering
- Control
- Operations Research
- Network Science
- Algorithmic Economics
- Privacy
- Vision
- Big Data
- Networks
- Probability
- Optimization
- Algorithms
- Learning
- Games & Markets
- Smart Grid/City
A new core has emerged

EE / CS / Control / …

Traditional programs do not teach this core
A new core has emerged in Games & Markets, Learning, Optimization, Algorithms, Probability, and Networks.

A key driver for research and education at Caltech (and CDS)
A new core has emerged.

A key driver for research and education at Caltech.

A new PhD program.

The core is dominating recent hiring.

Adam Wierman
Joel Tropp
Katrina Ligett
Venkat Chandrasekaran
Matt Elliot
Yisong Yue
Omer Tamuz
Joel Tropp
Core: Unique, interdisciplinary courses on
Breadth: Sample a few application areas
Depth: Choose a “focus” application area to study

Faculty involvement:
James Beck, Shuki Bruck, Oscar Bruno, Joel Burdick, Venkat Chandrasekaran, Mani Chandy, Mathieu Desbrun, John Doyle, Federico Echenique, Michelle Effros, Matthew Elliott, Ben Gillen, Babak Hassibi, John Ledyard, Katrina Ligett, Steven Low, Richard Murray, Houman Owhadi, Pietro Perona, Leonard Schulman, Peter Schroeder, Matt Shum, Omer Tamuz, Joel Tropp, Chris Umans, P. P. Vaidyanathan, Thomas Vidick, Adam Wierman, Yisong Yue.
The Computing & Mathematical Sciences (CMS) PhD

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Breadth: Sample a few application areas

Depth: Choose a “focus” application area to study

This session:

Some “visions” behind CMS @ Caltech

1. Pietro Perona (Vision & Learning & Biology & …)
2. Venkat Chandrasekaran (Optimization & Statistics & …)
3. Steven Low (Energy & Optimization & Networks & …)
4. Omer Tamuz (Networks & Economics & Math & …)
5. Katrina Ligett (Privacy & Economics & Algorithms & …)

...have your best undergrads apply!