CDAR Symposium Agenda
UC Berkeley – California Memorial Stadium

8:30 – 9:30 a.m. Breakfast

9:30 – 9:40 a.m. **Welcome**
Frances Hellman, UC Berkeley Physical Sciences
Carla Hesse, UC Berkeley Letters & Science

9:40 – 10:00 a.m. **CDAR: Goals and Aspirations**
CDAR applies new technologies to the most important problems in financial economics. Today's program is a first step toward accomplishing CDAR's mission, and we invite the audience to join us as we work toward our goals.
Panelists:

- Jessica Donohue, State Street
- Lisa Goldberg, CDAR

10:00 – 11:00 a.m. **Modeling Systemic Risk Using Networks**
Sanjiv Das, Santa Clara University, Leavey School of Business

Abstract: A review of network metrics, systemic risk models, and recent work on network models of systemic risk, including an application to real-time risk network monitoring. I will present a new systemic risk score based on individual bank risk and interconnectedness across institutions. In this metric, I will define risk contributions from each entity, risk increments, system fragility, entity criticality. The measure is robust to spillover risk, and splitting up too-big-to-fail banks may not hedge systemic risk.

11:00 – 11:15 a.m. Break

11:15 a.m. – 12:15 p.m. **Deep Learning for Mortgage Risk**
Kay Giesecke, Stanford University, Management Science & Engineering

Abstract: An unprecedented number of mortgage defaults in 2007 precipitated one of the greatest financial crises in recent memory. We propose deep neural network models for mortgage delinquency and prepayment, which capture loan-to-loan correlation due to geographic proximity and exposure to common risk factors. Using data for 120 million prime and subprime mortgages originated across the US between 1999 and 2014, the model is shown to provide accurate multi-period forecasts of loan- and pool-level risk.

12:15 – 1:30 p.m. Lunch

| 1:30 – 2:30 p.m. | **The Intersection of Data Science and Risk Analytics** |

1:30 – 2:30 p.m.

The Intersection of Data Science and Risk Analytics
An astrophysicist, a computer scientist working on financial data, and a mathematical economist discuss data science questions from the perspective of their disciplines.
Moderator: Bob Anderson, CDAR
Panelists:

- Saul Perlmutter, BIDS
- Laurent El Ghaoui, UC Berkeley
- Bob Anderson, CDAR

2:30 – 3:30 p.m.

Prediction and Sequential Decision Problems in Adversarial Environments
Peter Bartlett, UC Berkeley, Statistics and Computer Science

Abstract: In many decision problems, it is useful to model the process generating the data as an adversary with whom the decision method competes. Even decision problems that are not inherently adversarial can be usefully modeled in this way, since the assumptions are sufficiently weak that effective prediction strategies for adversarial settings are very widely applicable. This talk will review some recent advances in analysis and methods for online decision problems of this kind, and some implications for allocation, prediction, and option pricing.

3:30 – 3:45 p.m.

Move downstairs to Stadium Club & refreshments served

3:45 – 5:00 p.m.

Panel: Statistical Implications of Big Data Applied to Risk Modeling
Risk modeling focuses primarily on understanding the drivers behind unexpected losses affecting some particular objective such as meeting future liabilities or maximizing return on capital. More data are now available than ever before to understand distributions of future asset values. Increased computational capacity can now facilitate non-parametric and simulation-based analytical approaches in a way not available until recently. Machine-learning algorithms may lead to better ways to condition risk models on current market and macroeconomic regimes. What are the statistical implications of applying Big-data tools to risk modeling?

Moderator: Jeff Bohn, State Street
Panelists:
- Philip Stark, UC Berkeley
- Ben Davis, Citadel

5:00 – 5:15 p.m.

Closing Remarks
Bob Anderson, CDAR