

NSF/IARPA/NSA Workshop on the Science of Security Agenda

All sessions are in Napa 3 except where noted.

Sunday, 16 November

6-8pm Reception at Claremont (Monterey Room)

Monday, 17 November

8:30am Breakfast (Napa 3)

9:00am Welcome

Karl Levitt, National Science Foundation

Lisa Porter, Director, Intelligence Advanced Research Projects
Activity

Frederick Chang, University of Texas at Austin and former
Director of Research, National Security Agency

9:30-10:30 Keynote talk: Fred B. Schneider, Department of Computer Science,
Cornell University

A Map For Security Science

Abstract: While today much security research is about defending against the attack du jour, there has been theoretical work in computer security and there are the beginnings of a science base for security. This talk will discuss the kinds of questions one might expect a science base to address. It will also give examples of how such questions could be answered. Basic concepts in security, such as attack, policy, and enforcement turn out to be surprisingly subtle to define.

10:30-11 Break

11-noon Panel: *Is there a science of security (and if so, what might it look like)?*
Moderator: Carl Landwehr, IARPA

Panelists:

Anupam Datta, Carnegie Mellon University

Joshua Guttman, MITRE

Michael Reiter, University of North Carolina

noon-1:30 Lunch

Monday, 17 November, continued

1:30-2:30 Panel: *What can we learn from other fields?*

Moderator: Cliff Wang, ARO

Panelists:

Stephanie Forrest, University of New Mexico

Alfred Hero, University of Michigan

Stuart Russell, University of California, Berkeley

2:30-2:45 Discussion

2:45-3:00 Break

3:00-4:15 Breakout group discussions: (see page 4 for groups)

What can we learn from other fields? (Leader Pierre Moulin, UIUC)

How can we design systems with known security properties? (Leader Rebecca Wright, Rutgers University)

Is there a scientific way to measure security? (Leader Shouhuai Xu, University of Texas at San Antonio)

4:30-5:00 Reconvene for breakout group reports, discussion

6:00 Meet in Claremont Lobby to go to workshop dinner at Garibaldi's Restaurant (5356 College Ave.)

Tuesday, Nov 18

8:30am Breakfast

9-9:30am Frederick Chang, University of Texas at Austin and former Director of Research, National Security Agency

9:30-10:30 Panel: *How can we reason about impossible things?*

Moderator: Robert Herklotz, AFOSR

Panelists:

Byron Cook, Microsoft Research Cambridge/Cambridge University

Dusko Pavlovic, Kestrel Institute/Oxford University

Hal Varian, University of California, Berkeley/Google Chief Economist

10:30-10:45 Break

- 10:45-11:15 John Doyle, Professor of Control & Dynamical Systems, Electrical Engineering, and BioEngineering, California Institute of Technology
- 11:30-12:30 Panel: *Are scientific experiments in security possible?*
Moderator: Karl Levitt
- Panelists:
Roy Maxion, Carnegie Mellon University
John Mitchell, Stanford University
Vicraj Thomas, BBN Technologies
- 12:30-1:30 Lunch
- 1:30-2:30 Breakout discussions: (see page 4 for groups)
Complexity (Leader: Sampath Kannan, NSF)
Experimentation (Leader: Karl Levitt, NSF)
Composition (Leader: John Rushby, SRI)
- 2:30-3:00 Summary discussion
- 3:00-3:15 Break
- 3:15-4:15 Breakout discussions: (see page 4 for groups)
Questions and Promising Approaches for a Science of Security
- 4:15-5:00 Discussion, wrap-up

Breakout Groups

Monday, 3-4:15

| | | | |
|---------------------|--|--|---|
| Topic | <i>What can we learn from other fields?</i> | <i>How can we design systems with known security properties?</i> | <i>Is there a scientific way to measure security?</i> |
| Leader | Pierre Moulin | Rebecca Wright | Shouhuai Xu |
| Room | Zinfandel | Gamay | Cabernet |
| Participants | David Bray Fred Chang Anthony Ephremides Stephanie Forrest Robert Herklotz Alfred Hero Carl Landwehr Pierre Moulin Robert Meushaw Tim Murphy Fred Schneider Dawn Song Cliff Wang | Byron Cook Anupam Datta David Evans John Frink Greg Larson Karl Levitt John Mitchell Dusko Pavlovic Lisa Porter Michael Reiter Stuart Russell John Rushby Rebecca Wright Ty Znati | Son Dao Manfai Fong Joshua Guttman Sampath Kannan Steven King John Mallery Roy Maxion Nick Petroni Jim Silk Pieter Swart Vicraj Thomas Shouhai Xu Lenore Zuck |

Tuesday, 1:30-2:30

| | | | |
|---------------------|--|--|---|
| Topic | <i>Complexity</i> | <i>Experimentation</i> | <i>Composition</i> |
| Leader | Sampath Kannan | Karl Levitt | John Rushby |
| Room | Zinfandel | Gamay | Cabernet |
| Participants | Byron Cook John Doyle David Evans Manfai Fong Robert Herklotz Alfred Hero Sampath Kannan Dusko Pavlovic Nick Petroni Jim Silk Dawn Song Hal Varian Ty Znati Lenore Zuck | David Bray Fred Chang Son Dao John Frink Carl Landwehr Karl Levitt Roy Maxion Robert Meushaw Tim Murphy Stuart Russell Vicraj Thomas Cliff Wang Shouhai Xu | Anupam Datta Anthony Ephremides Joshua Guttman Steven King Greg Larson John Mallery John Mitchell Pierre Moulin Michael Reiter John Rushby Fred Schneider Pieter Swart Rebecca Wright |

Tuesday, 3:15-4:15

| Topic | <i>Questions and Promising Approaches for a Science of Security</i> | | |
|---------------------|--|---|--|
| Leader | Son Dao | Steven King | Pieter Swart |
| Room | Zinfandel | Gamay | Cabernet |
| Participants | Son Dao Anupam Datta John Frink Greg Larson Karl Levitt Roy Maxion Robert Meushaw John Mitchell Michael Reiter John Rushby Vicraj Thomas Rebecca Wright Shouhai Xu | John Doyle Anthony Ephremides Manfai Fong Joshua Guttman Sampath Kannan Steven King John Mallery Pierre Moulin Nick Petroni Fred Schneider Jim Silk Dawn Song Lenore Zuck | David Bray Fred Chang Byron Cook David Evans Robert Herklotz Alfred Hero Carl Landwehr Tim Murphy Dusko Pavlovic Stuart Russell Pieter Swart Hal Varian Cliff Wang Ty Znati |