ExCAPE: Expeditions in Computer Augmented Program Engineering

4 Jun 2012
(Monday)
9 am – 8:30 pm

5 Jun 2012
(Tuesday)
8:30 am – 2 pm

Kick-Off Meeting
Schedule for 4 Jun (Monday) – Wu & Chen Auditorium

9:00 am - 10:00 am  Overview and Introduction

10:00 am - 10:30 am  Coffee Break

10:30 am - 12:15 pm  Synthesis Approaches & Computational Engines
(Session Lead: Stavros Tripakis)

[Moshe Vardi]  Reactive synthesis
[Stephane Lafortune]  Synthesis techniques from discrete event systems
[Paulo Tabuada]  Synthesizing robust software
[Ras Bodik / Emina Torlak]  Programming with constraint solvers
[Armando Solar-Lezama]  Inductive learning with SMT solvers and beyond
[Sanjit Seshia]  Combining induction and deduction for synthesis - Discussion on synergies among different approaches

12:15 pm - 1:15 pm  Lunch

1:15 pm - 3:00 pm  Challenge Problems -- Four parallel sessions

[Breakout Session A]  Multicore protocols  (Location: Room 315)
[Breakout Session B]  Concurrent programming  (Location: Room 307)
[Breakout Session C]  Robotics  (Location: Room 612)
[Breakout Session D]  Networked systems  (Location: Room 512)

3:00 pm - 3:30 pm  Coffee Break

3:30 pm - 4:30 pm  Tools & Evaluation
(Session Lead: Jeff Foster)

[Bjoern Hartmann]  Evaluating high-level program specifications
[Rajeev Alur]  Proposal for synthesis competition
Discussion on benchmarks, evaluation, and programmer studies

4:30 pm - 5:30 pm  Education & Outreach
(Session Leads: Stephane Lafortune & Steve Zdancewic)

[Armando Solar-Lezama]  Smart graders for programming assignments using synthesis technology
Course modules

6:00 pm - 7:30 pm  Reception | Student posters

Location:
University of Pennsylvania Museum of Archaeology and Anthropology
Please use the Trescher Entrance (Stoner Courtyard) on South Street

7:30 pm  Dinner
Breakout Session A - Multicore Protocols

(Lead: Milo Martin)

1:15 pm - 1:20 pm  Introduction

1:20 pm - 1:35 pm  Milo Martin:  Multicore Protocol Design with Concolic Snippets

1:35 pm - 1:50 pm  Alberto Sangiovanni Vincentelli:  Architectural and Application Mapping Challenges for Multicore Systems

1:50 pm - 2:05 pm  Susmit Jha:  Synthesis of Parameters and Policies for Systems-On-Chip

2:05 pm - 2:20 pm  Stavros Tripakis:  Synthesizing the Alternating Bit Protocol  
(A Challenge Problem in Decentralized Controller Synthesis)

2:20 pm - 3:00 pm  Discussion and planning of 2-year research goals
Breakout Session B – Concurrent Programming
(Leads: Madhusudan Parthasarathy & Armando Solar-Lezama)

1:15 pm - 2:15 pm  Short talks

2:15 pm - 3:00 pm  Discussion:
- Problems with current interaction models for systems that do synthesis for concurrency and parallelism.
- Top 5 opportunities for impact in the area of concurrent and parallel programming.
- Are there good abstract models to help us reason about the problem?
- Potential approaches to lower the cost of synthesis, including ways of getting better feedback from users.
Review of existing research in synthesis for robotics applications

Unique challenges and computational problems for robotics domain

Planning of 2-year demo
### Breakout Session D – Networked Systems
*(Leads: Boon Thau Loo & Pamela Zave)*

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:15 pm - 1:20 pm</td>
<td>Introduction</td>
</tr>
<tr>
<td>1:20 pm - 1:35 pm</td>
<td>Alex Gurney: Challenges in safe routing</td>
</tr>
<tr>
<td>1:35 pm - 1:50 pm</td>
<td>Pamela Zave: Compositional network services and AT&amp;T’s operational perspective</td>
</tr>
<tr>
<td>1:50 pm - 2:05 pm</td>
<td>George Pappas: Synthesis opportunities in wireless control networks</td>
</tr>
<tr>
<td>2:05 pm - 2:20 pm</td>
<td>Boon Thau Loo: Brief survey of existing networking solutions</td>
</tr>
<tr>
<td></td>
<td>(Declarative networking, software-defined networking, constraint solvers</td>
</tr>
<tr>
<td></td>
<td>in network configurations)</td>
</tr>
<tr>
<td>2:20 pm - 3:00 pm</td>
<td>Discussion and planning of 2-year research goals</td>
</tr>
</tbody>
</table>
### Schedule for 5 Jun (Tuesday)

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
</tr>
</thead>
</table>
| 8:30 am - 10:30 am  | **Synthesis Methodology**  
(Session Leads: Ras Bodik & Alberto Sangiovanni-Vincetelli)  
[Session Leads] Presentations on “Challenge Problems”  
Discussion on common themes across challenge problems |
| **Coffee Break** | 10:30 am - 11:00 am |
| 11:00 am - 12:30 pm  | **Industry Panel & Feedback**  
(Panell Moderator: George Pappas)  
Panelists:  
John Field (Google)  
Limor Fix (Intel)  
Patrice Godefroid (Microsoft)  
Aarti Gupta (NEC)  
Himanshu Khurana (Honeywell)  
Andraes Kuehlmann (Coverity)  
Pieter Mosterman (Mathworks)  
Mark Wegman (IBM)  
Pamela Zave (AT&T) |
| **Lunch** | 12:30 pm - 1:30 pm |
| 1:30 pm - 2:00 pm  | **Discussion**  
Wrap-up  
Planning of activities |

---

**Page 6 of 9**