

Center for Embedded Systems

An NSF Industry/University Cooperative Research Center

State of the Center

Sarma Vrudhula, Arizona State University

Spyros Tragoudas, Southern Illinois University, Carbondale

Industrial Advisory Board meeting

May 16-17, 2013

SIU
Southern
Illinois
University
CARBONDALE



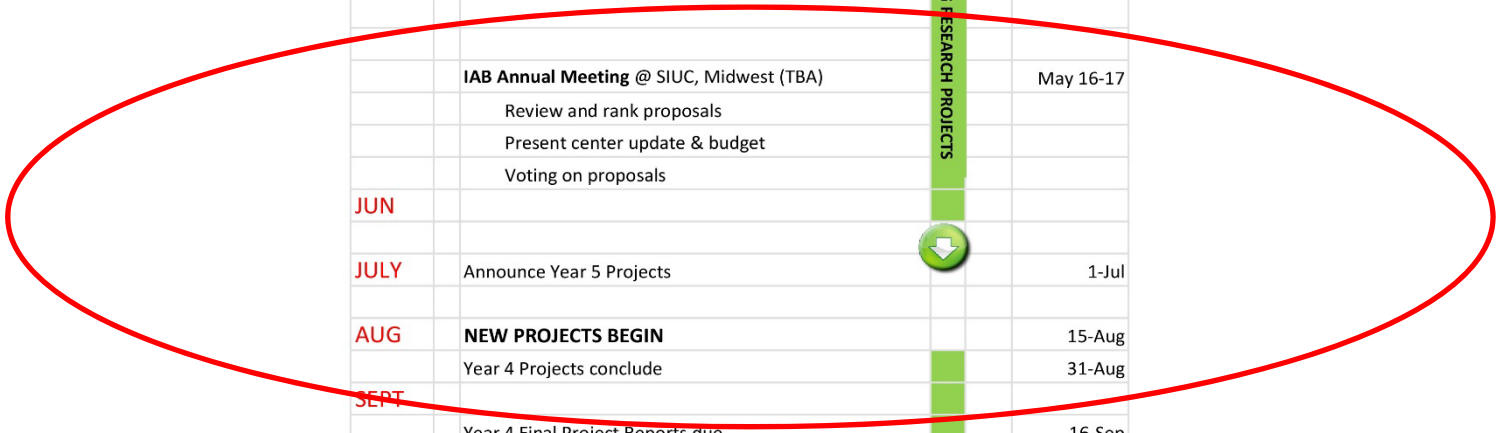
ASU Ira A. Fulton
Schools of Engineering
ARIZONA STATE UNIVERSITY

Thank You

- Nancy Beasley, CES Project Manager at SIU
- Lisa Christian, CES Project Manager at ASU
- Spyros Tragoudas – SIU Site Director

Project Selection Process

			2013 DATES
JAN	IAB Mid-Year Update Meeting @ ASU, Tempe, AZ	↓	Jan 22-23
FEB	Call for Research Priorities - industry	ON-GOING RESEARCH PROJECTS	6-Feb
	Research Priorities Due - industry to academia		25-Feb
MAR	RFP Sent to Faculty	ON-GOING RESEARCH PROJECTS	1-Mar
	Y5 Proposals Due to Directors		27-Mar
APR	Y5 Proposals Due to IAB	ON-GOING RESEARCH PROJECTS	1-Apr
	IAB review/soft vote on proposals		
	"Soft" Vote/Evaluations Complete		22-Apr
	Directors Notify Finalists		29-Apr
MAY	Final Y5 Proposals Due	ON-GOING RESEARCH PROJECTS	6-May
	Y5 Proposals Posted on CES website		10-May
	IAB Annual Meeting @ SIUC, Midwest (TBA)		May 16-17
	Review and rank proposals		
	Present center update & budget		
	Voting on proposals		
JUN		↓	
JULY	Announce Year 5 Projects	↓	1-Jul
AUG	NEW PROJECTS BEGIN	ON-GOING RESEARCH PROJECTS	15-Aug
	Year 4 Projects conclude		31-Aug
SEPT		ON-GOING RESEARCH PROJECTS	
	Year 4 Final Project Reports due		16-Sep
OCT		ON-GOING RESEARCH PROJECTS	
NOV			
DEC		↓	



Industry Membership

	Year 1	Year 2	Year 3	Year 4	Year 5
Intel (AZ)	✓	✓	✓	✓	✓
Raytheon	✓	✓	✓	✓	✓
Intel (OR)	✓	✓	✓	✓	✓
NAVSEA Crane	✓	✓	✓		
Wildlife Materials	✓	✓			
EMAC		✓	✓		
Intel (CA)		✓	✓	✓	✓
Caterpillar		✓	✓	✓	✓
Qualcomm		✓	✓	✓	✓
Toyota		✓	✓	✓	✓
DICKEY-john		✓	✓	✓	
Marvell			✓	✓	✓
General Dynamics			✓	✓	✓
Hamilton Sundstrand			✓	✓	✓
Rockwell Collins				✓	✓

CES Results

Year 1:

8 Faculty

14 Graduate Students

10 Projects

45 Internships (Intel Az)

Year 2:

12 Faculty

19 Graduate Students

15 Projects

30 Internships (Intel Az)

Year 3:

15 Faculty

30 Graduate Students

16 Projects

35 Internships (Intel Az)

Year 4:

19 Faculty

26 Graduate Students

18 Projects

35 Internships

Year 5:

18 Proposed Projects

CES to date (Y4 totals pending):

56 Papers / Conference Proceedings

7 Tools

5 Invention Disclosures filed

Year 5 Proposed Projects

	LIFE	PROJECT	PI	
1	1.1	Concurrency and Scheduling Analysis of Real-time Embedded Software on Multi-core Processors	YH Lee	ASU
2	1.2	Feasibility Study for an RF-Based Proximity Sensor using Embedded Antennas in High Velocity Projectiles	C. Hatziadoniu, F. Harackiewicz	SIUC
3	1.3	Performance Optimal Control of a System of Interconnected Components Under Thermal and Energy Constraints	S. Vrudhula	ASU
4	1.4	Multi-Partitioned Single Cores and Predictable Execution of Safety-Critical Tasks	D. Kagaris, H. Ramaprasad	SIUC
5	1.5	Parallelization of Embedded Control Applications on Multi-core Architectures: A Case Study	G. Fainekos, YH. Lee	ASU
6	1.6	An Effective Test Strategy Based on Coverage Driven ATPG	S. Tragoudas, T. Haniotakis	SIUC
7	2.1	Registration and Fusion of EVS and SVS Runway Images for Embedded Systems	L. Gupta	SIUC
8	2.2	All-optical Embedded Fiber-optic Up/down-links for Motor Controller	M. Sayeh	SIUC
9	2.3	Achieving Energy-efficient Mobile Computing Through Explicit Data Communication and Global Power Management	C. Wu	ASU

Year 5 Proposed Projects

	LIFE	PROJECT	PI	
10	2.4	Multicore Simulator Critical Path Analysis	S. Tragoudas	SIUC
11	2.5	Reliable Wireless Communications in Aircrafts and Other Challenging Environments	X. Zhou	SIUC
12	2.6	Improving Usability of Multi-core DSPs	A. Shrivastava	ASU
13	3.1	Towards Predictable Execution of Safety-Critical Tasks on Mixed-Criticality Multi-Core	H. Ramaprasad, D. Kagaris	SIUC
14	3.2	Verifiable Firmware Update Mechanisms for Embedded Systems	N. Weng, S. Tragoudas	SIUC
15	3.3	Visual Interface for Metric Temporal Logic Specifications	G. Fainekos, K. Yoshihiro	ASU
16	3.4	Ground Work for Embedding a Field Oriented Motor Controller into a Single System on a Chip	C. Hatziaioniu	SIUC
17	3.5	Adaptive Compressive Sensing Techniques for Low Power Sensors	H. Wang, S. Tragoudas	SIUC
18	3.6	Spintronic Threshold Logic Array	S. Vrudhula	ASU

Agenda

Thursday, May 16, 2013	
7:00 – 7:30 am	Registration Check-in and Breakfast, Drury Inn Breakfast Room
7:30 – 7:50 am	Opening Remarks & Introductions, Drury Inn Conference Room, Spyros Tragoudas (SIUC), Sarma Vrudhula (ASU)
7:50 – 8:30 am	NSF Message, Rita Rodriguez, CISE Program Director, NSF CISE/CNS and Alex Schwarzkopf, NSF ENG/OAD
8:40 – 8:50 am	Agenda / Format Overview, Byron Gillespie, Intel Corp., IAB Chair
8:50 – 9:20 am	New Projects, year 5 – group 1 (1.1 - 1.6); 5 min presentations
9:20 – 10:50 am	Poster Session, year 5 projects – group 1
10:50 – 11:30 am	LIFE Forms Feedback: Discussion, year 5 projects – group 1
11:30 – 12:30 pm	LUNCH
12:30 – 1:00 pm	New Projects, year 5 – group 2 (2.1 - 2.6); 5 min presentations
1:00 – 2:30 pm	Poster Session, year 5 new projects – group 2
2:30 – 3:10 pm	LIFE Forms Feedback: Discussion, year 5 new projects – group 2
3:10 – 3:15 pm	ASTC presentation
3:15 – 3:20 pm	Dell presentation
3:20 – 3:50 pm	New Projects, year 5 – group 3 (3.1 – 3.6); 5 min presentations
3:50 – 5:20 pm	Poster Session, year 5 new projects – group 3
5:20 – 6:00 pm	LIFE Forms Feedback: Discussion, year 5 new projects – group 3
6 – 6:30 pm	Happy Hour (all), Drury Inn
6:30 pm	Dinner (all), Bella Milano, 455 Regency Park, O'Fallon, IL 62269
Friday, May 17, 2013	
7:00 – 7:30 am	Breakfast, Drury Inn
8:00 – 11:00 am	IAB meeting (closed session), Drury Inn Conference Room

Areas of Expertise

- Power, Energy and Thermal-Aware Design
- Electronic System-level (ESL) Design and Technologies
- Embedded Multicore Architectures and Programming
- Embedded Software Systems
- Cyber-Physical Systems
- Integrated Circuit Technologies, Design, and Test