

Sponsored Program Summary
Preliminary FY14 Activities
August, 2014

Dave Reed

Vice President for Research

Michigan Tech

Outline

- NSF CAREER Award Recipients
- Sponsored Awards, Preliminary FY14
- Research Expenditures, Preliminary FY14
- Intellectual Property/Commercialization, Preliminary FY14
- Corporate Sponsorship, Preliminary FY14

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NSF's CAREER Program

- The CAREER Program is the National Science Foundation's most prestigious award
- Funds support early-career (untenured) STEM faculty for five years with the goal of building a foundation for a lifetime of STEM leadership
- Recognizes leaders in the integration of research and education
- Through FY13, Michigan Tech has had 35 CAREER recipients

Zhuo Feng

Department of Electrical and Computer Engineering

CAREER: Leveraging Heterogeneous Manycore Systems for Scalable Modeling, Simulation and Verification of Nanoscale Integrated Circuits



Future nanoscale Integrated Circuit (IC) subsystems may reach unprecedented complexity, involving billions of circuit components, making their modeling, analysis and verification tasks prohibitively expensive and intractable with existing EDA tools. On the other hand, emerging heterogeneous many core computing systems can theoretically delivery teraflops of computing power. This proposal aims to accelerate a paradigm shift in EDA research to more energy-efficient heterogeneous computing regimes by developing systematic hardware/software approaches to achieve scalable integrated circuit modeling, simulation and verifications.

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Shiyan Hu

Department of Electrical and Computer Engineering

CAREER: Integrated Research and Education in Physical Design Automation for Nanotechnology and VLSI Technology Co-Design



In VLSI chip design, the prevailing copper interconnect technology is approaching its fundamental physical limits, and novel on-chip interconnect materials such as carbon nanotubes and graphene nanoribbons have emerged as promising replacement materials.

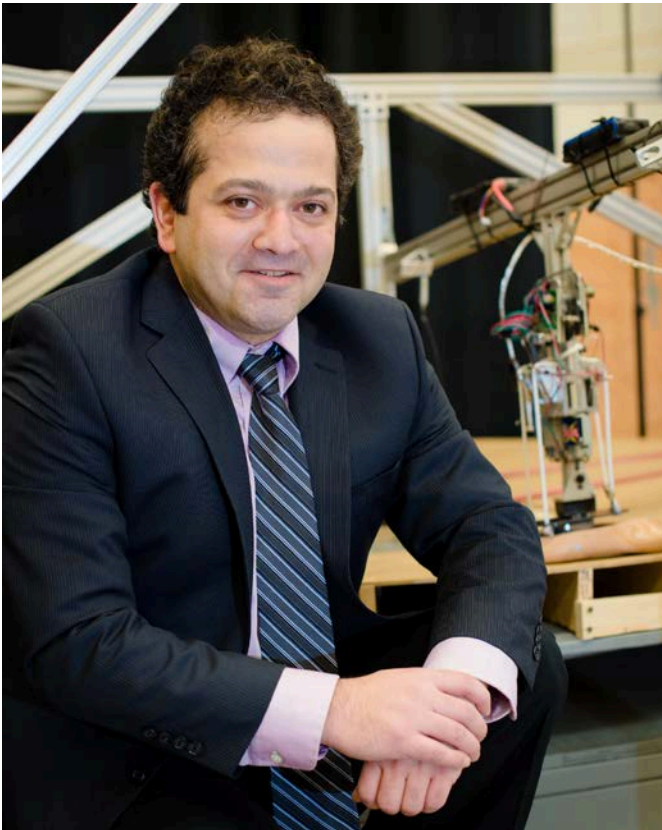
This project will develop a novel nanotechnology interconnect and copper interconnect co-design methodology which also includes various innovative enabling techniques such as co-design-aware interconnect synthesis and defect aware optimization. It has the potential to make fundamental contributions to the emerging carbon nanotube and graphene nanoribbon based integrated circuit design paradigm.

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Mo Rastgaar

Department of Mechanical Engineering-Engineering Mechanics

CAREER: Steerable Powered Ankle-foot Prostheses for Increased Mobility in Amputees



Over one million US citizens are limb amputees, primarily lower leg amputees. While powered prostheses reduce metabolic cost and improve gait speed, walking on uneven ground and turning steps remain challenging. Studies show that turning steps account for 8-50% of steps, may account for 25% of daily steps

This study aims to understand the human ankle function during different maneuvers in activities of daily living, especially turning. The developed knowledge will be incorporated in the design of a steerable, powered ankle-foot prosthesis capable of steering and traversing slopes, to enhance agility and maneuverability in amputees.

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Tolou Shokuhfar

Department of Mechanical Engineering-Engineering Mechanics

CAREER: A New Perspective on Biomineralization in Healthy and Dysfunctional Ferritins



Any dysfunction of ferritin protein can result in iron toxicity, serious illness, chronic diseases, and especially neurological diseases. Dysfunction in ferritin results in the alterations in the biomineralization of the ferritin cores, and therefore, understanding the process of biomineralization within ferritin, is of great importance in the study of neurodegeneration and other chronic diseases.

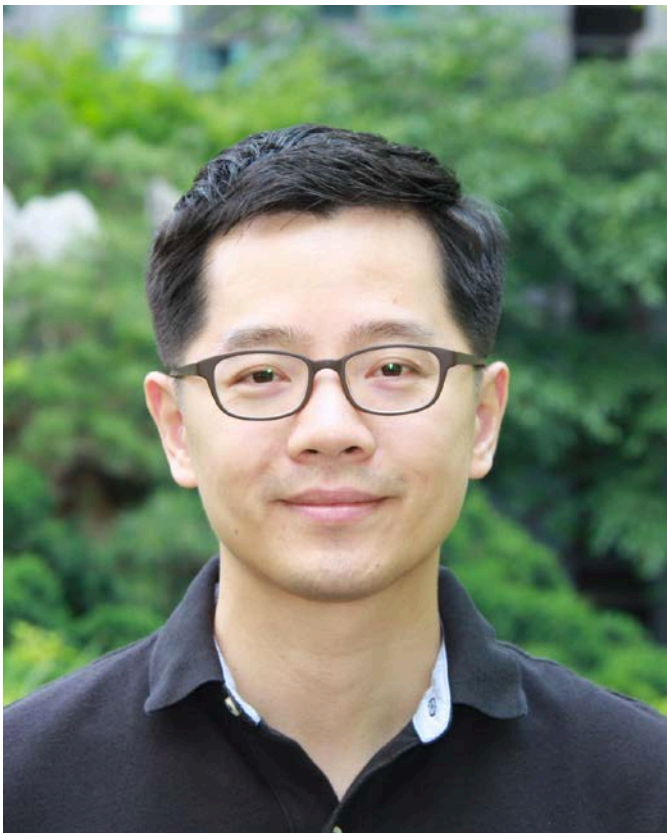
This project will investigate the in situ crystallization of ferrous ions into crystalline ferrihydrite and iron oxide nanoarticles as well as the demineralization of crystalline core in healthy and dysfunction ferritins in unprecedented resolutions within liquids. The goal of the work is to unveil the fundamental differences with dysfunctional ferritins responsible for neurological diseases.

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Chaoli Wang

Department of Computer Science

CAREER: Effective Analysis, Exploration and Visualization of Big Flow Data to Understand Dynamic Flows



The goal of this CAREER project is to pioneer a comprehensive framework toward effective visual understanding of flow fields by

- promoting an innovative database approach to shape-based field line modeling and classification,
- investigating new string-, sketch- and graph-based interfaces and interactions for flow field exploration, and
- exploring occlusion and clutter reduction through unconventional streamline repositioning and automatic tour generation.

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Sponsored Awards, Preliminary FY14

Sponsor	Proposals Submitted		Awards Received		Awards Received (\$)		Variance \$	Variance %
	FY '14	FY '13	FY '14	FY '13	FY '14	FY '13		
	as of 6/30	as of 6/30	as of 6/30	as of 6/30	as of 6/30	as of 6/30		
NASA	73	87	42	54	1,733,945	3,503,623	-1,769,678	-51%
National Science Foundation	197	209	72	70	11,780,091	9,405,698	2,374,393	25%
US Department of Agriculture	65	53	48	42	1,426,254	1,748,278	-322,024	-18%
US Department of Defense	72	67	75	77	8,854,905	12,315,011	-3,460,106	-28%
US Department of Education	-	-	1	3	50,446	158,525	-108,079	-68%
US Department of Energy	28	36	17	19	2,582,303	2,335,101	247,202	11%
US Department of HHS	52	48	9	11	1,012,014	802,545	209,469	26%
US Department of Transportation	21	35	16	26	2,297,817	3,216,108	-918,291	-29%
Other Federal Agencies*	59	40	36	31	2,208,182	1,659,669	548,513	33%
Federal Agency Total	567	575	316	333	31,945,957	35,144,558	-3,198,601	-9%
State of Michigan	28	27	21	24	2,949,105	1,742,675	1,206,430	69%
Industrial	215	171	205	146	7,149,601	4,515,619	2,633,982	58%
Foreign	16	17	7	9	443,072	282,087	160,985	57%
All Other Sponsors	92	109	56	51	2,358,470	1,306,103	1,052,367	81%
Subtotal	918	899	605	563	44,846,205	42,991,042	1,855,163	4%
Gifts**	-	-	357	299	3,292,625	4,993,501	-1,700,876	-34%
Crowd Funding	-	-	19	14	24,134	32,302	-8,168	-25%
Grand Total	918	899	981	876	\$48,162,964	\$48,016,845	\$146,119	0%

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Research Expenditures, Preliminary FY14

College/School/Division	FY2014	FY2013	Variance	%
Administration*	2,858,994	3,161,048	(302,054)	-9.6%
College of Engineering	25,282,304	25,003,388	278,916	1.1%
College of Science & Arts	13,740,203	13,650,314	89,889	0.7%
Institute for Leadership and Innovation (ILI)	398,128	307,566	90,562	29.4%
Keweenaw Research Center (KRC)	8,184,775	8,572,011	(387,236)	-4.5%
Michigan Tech Research Institute (MTRI)	10,898,674	10,629,712	268,962	2.5%
School of Business & Economics	1,454,644	1,816,991	(362,347)	-19.9%
School of Forest Resources & Environmental Science	5,877,074	7,187,874	(1,310,800)	-18.2%
School of Technology	467,453	360,496	106,957	29.7%
Total	69,162,249	70,689,400	(1,527,151)	-2.2%

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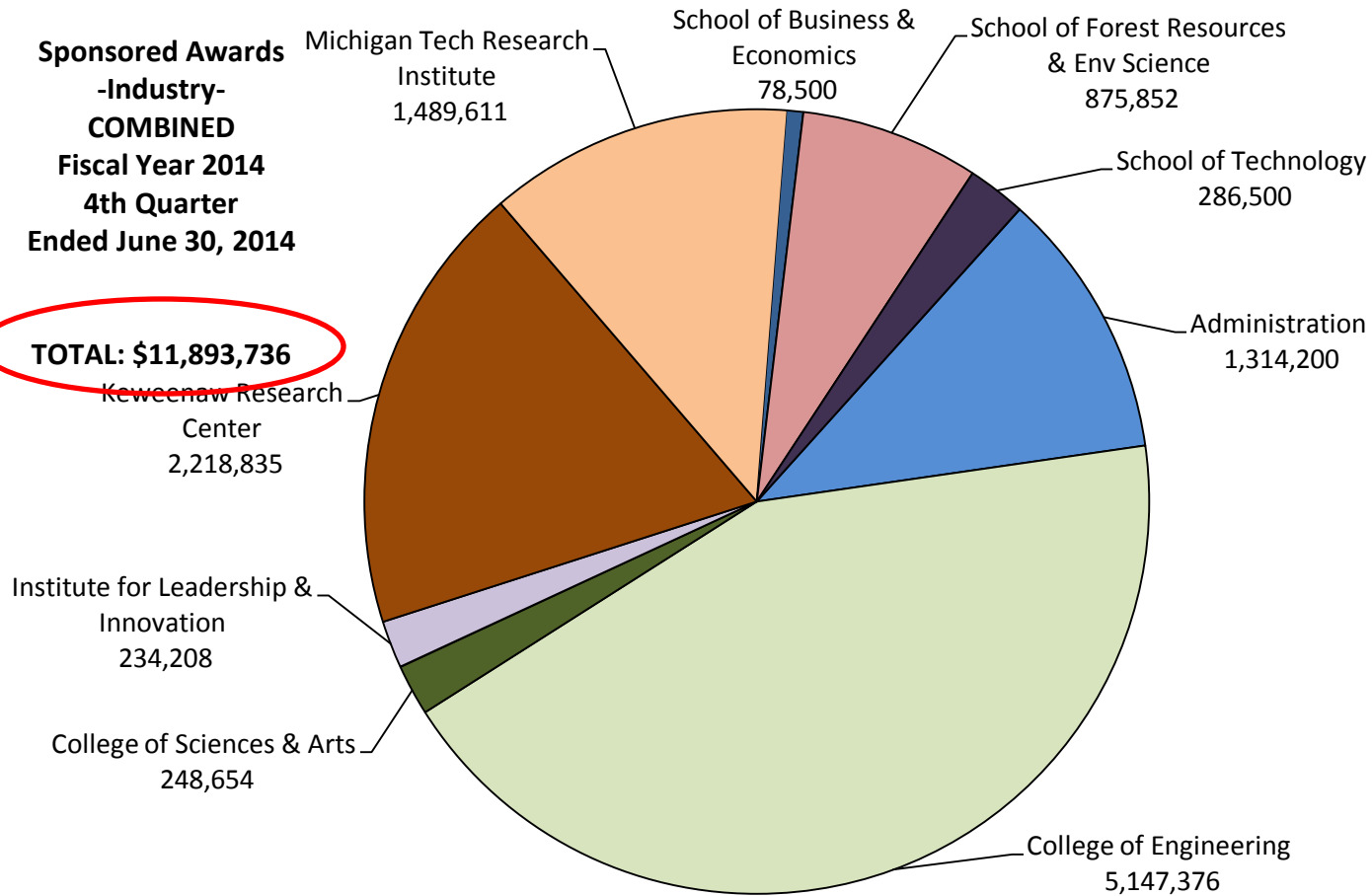
Intellectual Property, Preliminary FY14

		FY14	FY13	
Disclosures Received ²		45	51	-12%
Nondisclosure Agreements		96	111	-14%
Patents Filed or Issued ²		23	27	-15%
License Agreements		15	26	-42%
Gross Royalties		\$ 262,424	\$ 193,985	35%

Preliminary FY14 Corporate Sponsorship

**Sponsored Awards
-Industry-
COMBINED
Fiscal Year 2014
4th Quarter
Ended June 30, 2014**

TOTAL: \$11,893,736



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