Installation Ceremony

Chenyang Lu, PhD, as the Fullgraf Professor in the Department of Computer Science & Engineering

Lan Yang, PhD, as the Edward H. and Florence G. Skinner Professor in the Department of Electrical & Systems Engineering

Monday, March 16, 2015 | 5:30 p.m. | Whitaker Hall, Auditorium
Leading a World-Class University

Chancellor Mark Wrighton

Dean Ralph Quatrano
In Memory of Charles M. Fullgraf
“I want to be a PhD”
Education

- Shandong Normal University High (1984-1990)

- University of Science and Technology of China (BS 1995)

- Institute of Software, Chinese Academy of Sciences (MS 1997)

- University of Virginia (PhD 2001)
Professor Jack Stankovic

- Joined UVa seven months before me.

- What I learned from Jack:
  - Courage to explore new areas
  - Passion to build real systems
  - Write “crisply”
  - Students are the most important
  - Led me into the exciting world of Internet of Things at its beginning.
Internet of Things

The Golden Age

- **Hardware**: small devices integrating computers, sensors and radios.
- **Wireless**: connect millions of devices to the Internet.
- **Analytics**: making sense of sensor data.

→ Large networked system for smart sensing and control.
Real-Time Clinical Monitoring

- Clinical deterioration in patients in general hospital wards
  - 4-17% suffer adverse events.
  - Clinical deterioration is often preceded by changes in vitals.
  - Current: collect vital signs manually every 5-10 hours.

- Wireless real-time patient monitoring
  - Collects vital sign data from patients every minute.
    - Same level of monitoring in general wards as in ICU.
  - Large wireless mesh networks with no infrastructure.
    - Low cost, easy deployment.
Trial in Barnes-Jewish Hospital

- First clinical monitoring system using wireless sensor networks.

- 7 months, 46 patients

- Reliable and real-time monitoring
  - 1 reading/min
  - >99% median network reliability.

Large-Scale Clinical Monitoring

- 7 units, 14 months, 97 patients
- Integrated with hospital IT systems
Save Our Aging Infrastructure

- >26% of the nation's bridges are structurally deficient or functionally obsolete. [ASCE 2009]
  - Manually inspect once every two years.

- Wireless sensor networks detect damages
  - Every day or week.
  - On demand during and after disaster.
  - Easy to deploy, long-term monitoring.
Wireless Structural Control

- Save structures from disasters through active control.

Bill Emerson Memorial Bridge
- Main span: 1,150 ft.
- Carries up to 14,000 cars a day over Mississippi.
- In New Madrid Seismic Zone
- Replace joints of the bridge by 24 hydraulic actuators

Wireless structural control systems
- Co-design control and wireless networks
- Integrated cyber-physical simulation.
The Real Heroes

Current PhD Students
- Rahav Dor
- Dolvara Gunatilaka
- Bo Li
- Chong Li
- Jing Li
- Chao Wang

Graduated PhDs
1. Chengjie Wu (2014)
2. Sisu Xi (2014)
5. Yong Fu (2013)
Collaborating across Boundaries

Washington University
- CSE: Kunal Agrawal, Roger Chamberlain, Yixin Chen, Chris Gill, Roch Guerin, Robert Pless
- Engineering: Pratim Biswas, Humberto Gonzalez, Arye Nehorai
- Medicine: Thomas Bailey, Marin Kollef, Susan Stark

Other Universities
- Purdue: Shirley Dyke
- UIUC: Tarek Abdelzaher, Gul Agha, Bill Spencer
- UPenn: Insup Lee, Linh Phan, Oleg Sokolsky
- Vanderbilt: Aniruddha Gokhale, Xenofon Koutsoukos, Doug Schmidt
- VCU: Daren Chen

Industries
- Emerson: Bill Drake, Jose Gutierrez, Eric Rotvold
- Microsoft: Ranveer Chandra, Jie Liu, Sriram Sankar
- Samsung: Tae-Suk Kim, Taerim Park
- VMware: Anne Holler
My Academic Home

- Department of Computer Science and Engineering
  - Chairs: Gruia-Catalin Roman, Jonathan Turner, Jeremy Buhler, Roch Guérin

- Thanks for an energetic, collegial and supportive environment!
My Angels

THE PERFECT YOU
She made me a better scientist