

DISTINGUISHED LECTURE SERIES

# EECS COLLOQUIUM

## Fall 2015



**Wednesday**  
**October 7**  
4:00 - 5:00pm

**Refreshments**  
served at 3:30pm

**Hewlett-Packard**  
**Auditorium**  
306 Soda Hall

## MIT Cheetah: New design paradigm shift toward mobile robots

**Sangbae Kim**

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Director of the Biomimetic Robotics Lab, MIT

### **Abstract**

We are entering the new era of mobile robots. Recent technological advances in legged robots are shifting the range of robotic applications particularly toward elderly care and disaster situations. Unlike the manufacturing applications focusing on accuracy in position-tracking, these new mobile robot applications require a different set of hardware/software design requirements including impact mitigation and contact force control. The talk will discuss the new robot design paradigm for these emerging robotic applications focusing on the actuator characteristics and the impulse planning locomotion control approaches. As a successful embodiment of such paradigm, the talk will introduce the constituent technologies of the MIT Cheetah. Currently, the MIT cheetah is capable of running upto 6m/s at animals' efficiency and capable of jumping over a 40cm-high obstacle autonomously.

### **Biography**

Prof. Sangbae Kim, is the director of the Biomimetic Robotics Laboratory and an Associate Professor of Mechanical Engineering at MIT. His research focuses on the bio-inspired robotic platform design by extracting principles from complex biological systems. Kim's achievements on bio-inspired robot development include the world's first directional adhesive inspired from gecko lizards, and a climbing robot, Stickybot, that utilizes the directional adhesives to climb smooth surfaces featured in TIME's best inventions in 2006. The MIT Cheetah achieves stable outdoor running at an efficiency of animals, employing biomechanical principles from studies of best runners in nature. This achievement was covered by more than 200 articles. He is a recipient of King-Sun Fu Memorial Best Transactions on Robotics Paper Award (2008), DARPA YFA(2013), and NSF CAREER (2014) award.