

JONATHAN E. CLARK

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RESEARCH INTERESTS

The dynamics and design of robotic locomotion systems, including: modeling, analysis, simulation, compliant mechanisms, rapid prototyping, and smart system design.

EDUCATION

Stanford University, Stanford, California

Ph.D. in Mechanical Engineering, Design Division, 2004

Specialization: Design, Robotics

M.S. in Mechanical Engineering, Design Division, 2000

Brigham Young University, Provo, Utah

B.S. in Mechanical Engineering with University Honors, 1998

RESEARCH EXPERIENCE

Assistant Professor, August 2007-Present

Department of Mechanical Engineering, Florida A&M-Florida State University
College of Engineering.

IC Postdoctoral Research Fellow, Sep 2004-Aug 2007

Modeling and analysis of the role of mechanical compliance in the design of legged robots for operation in outdoor environments. Faculty Sponsor: Prof. Daniel Koditschek

- Developed the first bio-inspired dynamic climbing robot.
- Developed and analyzed models for dynamic climbing systems.
- Oversaw the development of Shape Deposition Manufacturing facilities at Penn.
- Mentored graduate and undergraduate students in research and design activities.

Postdoctoral Researcher, Ricoh Innovations Inc. Jun 2004 – Aug 2004

Shared Media Group. Designed and developed mechanical devices to capture and share paperless media in the workplace. Project Leader: John Barrus

Graduate Research Assistant, Stanford University, 1998-2004

Biomimetic Robotics Laboratory, Department of Mechanical Engineering,
Research Advisor: Prof. Mark R. Cutkosky

- Refined process planning techniques for the construction of rapid prototyping parts using shape deposition manufacturing, an emerging layered manufacturing process.
- Designed and built several generations of the Sprawl family of small, fast, hexapedal running robots. Created a series of novel leg designs utilizing multi-material compliant mechanisms with embedded actuators.

Undergraduate Research Assistant, Brigham Young University, 1995-1998
 Association for the Development of Computer-Aided Tolerancing Software,
 Department of Mechanical Engineering

PUBLICATIONS

Archival/Journal Papers

Cham, J.G., Bailey, S. A., **Clark, J. E.**, Full, R. J. and Cutkosky, M. R., “Fast and Robust: Hexapedal Robots via Shape Deposition Manufacturing,” *International Journal of Robotics Research*, Vol. 21(10), pages 869-882, 2002.

Clark, J.E. and Cutkosky, M. R., “The Effect of Leg Specialization in a Biomimetic Hexapedal Running Robot,” *ASME Journal of Dynamic Systems, Measurement, and Control*, Vol 128, pages 26-35, 2006.

Kim, S., **Clark, J. E.** and Cutkosky, M. R., “iSprawl: Design and Tuning for High-Speed Autonomous Open-Loop Running.” *International Journal of Robotics Research*, 25(9), pages 903-912, 2006

Clark, J. E. and Koditschek, D. E. “A Spring-assisted One Degree of Freedom Climbing Model”, Lecture Notes on Control and Information Sciences, pages 43-64, Oct, 2006.

Clark, J. E. and Koditschek, D. E. “Analysis of Stability in Vertical Dynamic Climbing” — in preparation for submission to *International Journal of Robotics Research*.

Clark, J. E., Lin, P.C., Lynch, G., Komsuoglu, H., and Koditschek, D. E. “A Bio-inspired Dynamical Vertical Climbing Robot” — in preparation for submission to *IEEE Transactions on Robotics*.

Referred Conference Publications

Clark, J. E., Cham, J. G., Bailey, S. A., Froelich, E. M., Nahata, P. K., Full, R. J. and Cutkosky, M. R., “Biomimetic Design and Fabrication of a Hexapedal Running Robot,” Intl. Conf. Robotics and Automation (ICRA2001), Seoul, Korea, May 21-26, 2001.

- Clark, J. E.**, Xia, L. and Cutkosky, M. R., “An Interactive Aid for Designing and Planning Heterogeneous Layered Prototypes,” Proc. ASME DETC 2001, Pittsburg, Pennsylvania, USA, September 9-12, 2001.
- Cham, J. G., Karpick, J., **Clark, J. E.** and Cutkosky, M. R., “Stride Period Adaptation for a Biomimetic Running Hexapod,” 10th International Symposium of Robotics Research, Lorne, Victoria, Australia, November 9-12, 2001.
- Kim, S., **Clark, J. E.** and Cutkosky, M. R., “iSprawl: Autonomy, and the Effects of Power Transmission,” 7th International Conference on Climbing and Walking Robots (CLAWAR 2004), Madrid, Spain, September 22-24, 2004.
- Provancher, W. R., **Clark, J. E.**, Geisler, B., and Cutkosky, M. R., “Toward Penetration-based Clawed Climbing,” 7th International Conference on Climbing and Walking Robots (CLAWAR 2004), Madrid, Spain, September 22-24, 2004.
- Clark, J. E.**, Thelen, D.G. and Cutkosky, M. R., “Dynamic Simulation and Analysis of a Passively Self-Stabilizing Hexapedal Running Robot” Proceedings ASME IMECE 2004, Anaheim, CA, November 13-20, 2004.
- Clark, J. E.** and Cutkosky, M. R., “Stability Measure Comparison for the Design of a Dynamic Running Robot,” 8th International Conference on Climbing and Walking Robots (CLAWAR 2005), London, England, September 13-15, 2005.
- Clark, J. E.**, Provancher, M.R. and Mitiguy, P., “Theory, Simulation, and Hardware: Lab Design for an Integrated System Dynamics Education” Proceedings ASME IMECE 2005, Orlando, FL, CA, November 5-11, 2005.
- Clark, J. E.**, Goldman, D. I., Chen, T. S., Full, R. J. and Koditschek, D. E. “Towards Vertical Dynamic Climbing,” Proceedings of the 9th International Conference on Climbing and Walking Robots, Brussels, Belgium, Sep. 2006.
- Burden, S. and **Clark, J. E.** and Weingarten, J. and Komsouglu, H. and Koditschek, D. E. “Heterogeneous Leg Stiffness and Roll in Dynamic Running,” IEEE International Conference of Robotics and Automation, Rome, Italy, Apr 10-14, 2007.
- Clark, J.E.**, Goldman, D. G., Lin, P. C., Lynch, G., Chen, T. S., Komsuoglu, H., Full, R. J., and Koditschek, D. E., “Design of a Bio-inspired Dynamical Vertical Climbing Robot,” Robots: Science and Systems, Atlanta, GA, June 27-29, 2007.