

Henry M. Clever

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EDUCATION

Georgia Institute of Technology, Atlanta, GA 2016 - Present

Ph.D. Candidate - Robotics

Research:

Healthcare Robotics Lab – Advisor: Charles C. Kemp

Advance capabilities of robots to provide assistance in unstructured environments

Deep learning for human pose estimation and robotics using haptic and vision perception

Semi-autonomous robot operation, multi-robot collaboration, and human-robot systems

Frequent collaboration with end users, persons with disabilities, and clinicians

Coursework:

Artificial Intelligence, Deep Learning, Human-Robot Interaction, Human Integrated Systems, Interfacing for Engineers and Clinicians, among others.

New York University Tandon School of Engineering, Brooklyn, NY 2014 - 2016

M.S. Mechanical Engineering

Research:

Applied Dynamics and Optimization Lab – Advisor: Joo H. Kim

Energy consumption of robots and mechanisms in relation to human motion

Optimal motion planning and control of dynamic systems

Balance stability and gait analysis of passive dynamic walking

Coursework:

Advanced Dynamics, Control Systems, Applied Engineering Mathematics, Transport

Phenomena, Robot Mechanics, Robotics for Disabilities, Mechatronics, Advanced

Mechatronics, among others.

The University of Kansas, Lawrence, KS 2009 - 2014

B.S. Mechanical Engineering

Research:

Biofluid Mechanics – Advisor: Sarah L. Kieweg

Non-Newtonian fluids theory for anti-HIV drug delivery

Signal processing and fluid imaging

Notable Experience:

Engineering tutor – Thermodynamics I & II, Digital Computation Methods

Capstone senior design team leader

Tour guide – KU Student Ambassadors

PUBLICATIONS

Clever, H. M., A. Kapusta, D. Park, Z. Erickson, Y. Chitalia, C.C. Kemp. "Estimating 3D Human Pose on a Configurable Bed from a Single Pressure Image," IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2018.

Erickson, Z., H. M. Clever, G. Turk, C. K. Liu, C. C. Kemp, "Deep Haptic Model Predictive Control for Robot-Assisted Dressing," IEEE International Conference on Robotics and Automation (ICRA), 2018.

Bhattacharjee, T., H. M. Clever, J. Wade, C. C. Kemp. "Multimodal Tactile Perception of Objects in a Real Home." IEEE Robotics and Automation Letters (RAL), 2018.

Grice, P.M., Y. Chitalia, M. Rich, H.M. Clever, C.C. Kemp. "Autobed: Open hardware for accessible web-based control of an electric bed." Rehabilitation Engineering and Assistive Technology Society of North America (RESNA), 2016.

Clever, H.M., Brown, A., Kapila, V. "Using an AR Drone Lab in a High School Classroom to Promote Quantitative Research." The 123rd Annual American Society of Engineering Education Conference and Exposition (ASEE), 2016.

Anwar, R., H.M. Clever, J. Fleenor, B. Hu, V. Kheyfets, H. Sis, S.L. Kieweg. "Thin Film Coating Flows in Vaginal Drug Delivery." 7th World Congress of Biomechanics, 2014.

Hu, B., H.M. Clever and Kieweg, S.L. "Contact Line Instability of Gravity-driven Flow of Powerlaw Fluids: Comparison of Experiments and Simulations", The 66th Annual Meeting of the American Physical Society's Division of Fluid Dynamics (APS-DFD), 2013.

Clever, H.M., H. Evans, S.L. Kieweg. "Ultramouse: A communicative device which allows those with disabilities to operate a computer using head movement." ASME International Mechanical Engineering Congress and Exposition Undergraduate Poster Presentation, 2013.

PATENTS

Kemp, C.C., H. M. Clever. "A Low-Cost General-Purpose Mobile Manipulator for Indoor Use", U.S. Patent Application No. 62/473,778. Provisional Filing Date: March 20, 2017. Patent application submitted to USPTO March 2018.

Kemp, C.C., H. M. Clever. “Additional Hardware and Software for a Low-Cost General-Purpose Mobile Manipulator for Indoor Use”, U.S. Patent Application No. 62/626,265. Provisional Filing Date: February 5, 2018. Patent application submitted to USPTO March 2018.

AWARDS AND HONORS

NSF Graduate Research Fellowship (GRF)	2015 – Present
President’s Fellowship – Georgia Tech	2016 – Present
NRT – NSF Research Traineeship – Georgia Tech	2016 – 2018
Selected speaker – New York University President’s Global Council	2015
NSF G-K12 Fellowship: Applying Mechatronics to Promote Science – NYU	2014 – 2015
3rd place, University of Kansas Innovation and Collaboration Fair	2014
Wesley G. Kramer Scholar Award – University of Kansas	2014
2nd place, ASME IMECE Undergraduate Poster Competition	2013
3rd place, Sigma Xi Undergraduate Research Symposium – University of Kansas	2013
Undergraduate Research Award – University of Kansas	2013
Eagle Scout – Scouts of America	2006

WORK EXPERIENCE

Robots for Humanity: Design Engineer, Menlo Park, CA 2012-Present
Collaboration between Willow Garage, Inc., Healthcare Robotics Lab, and Henry and Jane Evans

Project #1: The WOUSE: PR2 robot safety stop device

Set of customized safety goggles to detect a wince on the user.

See www.ros.org/wiki/wouse for videos and further documentation

Project #2: The Ultramouse: A device to control a computer cursor with head movement

Watch the Ultramouse in action: www.youtube.com/watch?v=2kRi1g88mWI

Featured on the evening news in Kansas City (KCTV5), Topeka–Capital Journal and used by a person with quadriplegic on TED Mid-Atlantic

Project #3: The AutoBed: A device enabling control of a hospital bed via computer interface

Watch the QuadRock, where the AutoBed enables a person with quadriplegia to dance:
www.youtube.com/watch?v=-t5U4LzEz0Y

Project #4: The Whiskey-bot: Assistive EEG-based drinking system

Whiskey-bot in action: www.youtube.com/watch?v=D9E8Q1PQ9Mw

Featured and described in TEDx Sonoma: www.youtube.com/watch?v=Tg7EHj74AKk

Briem Engineering: Intern, St. Louis, MO 2011 – 2012
Non-Destructive Testing (NDT) using ultrasonic equipment to inspect industrial sites
Develop testing methods, work with sub-contractors, data analysis, report writing
Metallurgical testing with scanning electron microscope, tensile testing machine, axial load tester, among other equipment.

Frontenac Bank: Teller, St. Louis, MO 2009 – 2010
Customer service, account management, telephone reception, executive assistance

OUTREACH

Teaching Assistant – Introduction to Biomechanics, Georgia Tech 2017
Sophomore level course in the Biomedical Engineering Department
Lesson plan preparation, test preparation, recitation instructor

Applied Research Innovations in Science and Engineering program mentor, NYU 2014 – 2016
Research immersion program for 10th and 11th grade high school students
Mentored five students throughout two summers of research
Taught computer programming, circuits, basic control systems

FIRST Robotics Club Leader – Millennium Brooklyn High School, Brooklyn, NY 2014 – 2015
Started robotics club and led weekly meetings, recruiting twenty students
Taught students programming and hardware development
Led students to build working robot and compete in First Tech Challenge (FTC) of NYC

Teaching Assistant – Millennium Brooklyn High School, Brooklyn, NY 2014 – 2015
Ninth grade quantitative research class, co-instructor
Mentor students with special needs, particularly Autism Spectrum Disorders (ASD)

SKILLS

Python, C++, HTML, Javascript, CSS, MATLAB, Simulink, LabVIEW, Python, PBASIC, Patran/Nastran Finite Element Analysis, Solidworks, Autodesk, Visual 3D, Machining, Wood working, Automotive repair