

# **Claire Davies**

**Assistant Professor, Faculty of Engineering and Applied Science, Mechanical and Materials Engineering at Queen's University**

Kingston, ON, CA

My primary research goal focuses on increasing independence of people with disabilities

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## **Biography**

My interest in biomedical engineering evolved while volunteering at Bloorview Children's Hospital (now Holland Bloorview Kids Rehabilitation Hospital). I found that the technology available to these children did not allow them the freedom of other children. I have since dedicated my research career to improving the lives of people with disabilities. My research is diverse covering three main areas: biomaterials, motion analysis and assistive technology.

My primary research goal focuses on increasing independence of people with disabilities. Understanding the perceptual and physical responses of the senses, primarily vision, haptics and sound, has given me insight into how design of devices should be undertaken to create human-machine interfaces that are easily navigated and accepted. After spending several years designing to meet the needs of specific clients, I have realised the need for universal design. Universal design is becoming increasingly popular such that devices should be easy to use by all people without the need for adaptation.

I am currently an assistant professor in Mechanical and Materials Engineering at Queen's University with an honorary senior lecturer appointment in the Departments of Surgery and Mechanical Engineering at the University of Auckland. Most of my work is interdisciplinary and seeks to combine input from both clinicians and engineers in the design of medical technologies. Some of the student projects of which I am the primary supervisor include development of a system that will allow tailored reminiscence therapy for individuals with cognitive impairment, development of a boccia ramp for paralympic athletes, development of an umbrella for individuals with muscular dystrophy, and methods to simplify computer tasks for youth with cerebral palsy.

I continue to expand my areas of research to establish more evidence based evaluations of individuals with assistive technology. Improvements to prosthetic and orthotic design will allow increased efficiency of human movement. Increasing the universality of assistive technology will enable more effective use of devices. Interface design that provides ease of use is essential to the acceptance by all individuals. My research projects allow engineering students to engage with clinicians and complete design projects that are clinically relevant. Expanding this research can increase the productiveness of all individuals and allow them to become more confident members of our society.

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## **Areas of Expertise**

Biomaterials, Motion Analysis, Assistive Technology, Increasing Independence of People with Disabilities, Universal Design, Materials Engineering

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## **Affiliations**

Professional Engineers Ontario : Licensed Member, American Academy of Cerebral Palsy and Developmental Medicine : Member, Australasian Academy of Cerebral Palsy and Developmental Medicine : Member, Cerebral Palsy Society : Member

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## **Event Appearances**

**Expansion Cursor: A Zoom Lens that can be Voluntarily Activated by the User at Every Individual Click**  
Proceedings of the 28 th Australia Conference on Human Computer Interaction

**The Effect of Surface Electromyography Placement on Muscle Activation Amplitudes and Timing**  
IEEE EMBS International Student Conference

**The Ethical and Practical Issues Surrounding the Design of Assistive Technology for Individuals with Severe Physical Disability and Complex Communication Needs**  
Proceedings of the 28 th Australia Conference on Human Computer Interaction

**Repeatability of Eye-Hand Movement Onset Asynchrony Measurements and Cerebral Palsy: A Case Study**  
Computer Human Interaction New Zealand Conference

**Model based Open-Loop Posture Control of a Parallel Ankle Assessment and Rehabilitation Robot**  
AIM 2015

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## **Education**

**University of Auckland, Department of Surgery**  
Postdoctoral Research Fellowship

**University of Waterloo**  
Ph.D. Systems Design Engineering

**University of Waterloo**  
Graduate Certificate University Teaching

**University of Calgary**  
M.Sc. Biomedical Engineering

**Queen's University**  
B.A.Sc. Materials and Metallurgical Engineering

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## **Accomplishments**

**Emerging Researcher Award**

2014

Auckland University Engineers Association

**National AMP Scholarship**

2013

**Advice First Innovator's Award**

2013

**Maurice and Phyllis Paykel Trust Grant**

2013

**Auckland Medical Research Foundation Conference Travel Grant**

2013

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