

Graham Wilson, PhD

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I am a researcher in Human-Computer Interaction, focussing on the areas of haptic interfaces, affective feedback and virtual reality. My interests are predominantly understanding the perceptual and cognitive factors of interaction with novel computing devices: tailoring new interfaces to suit the range and limits of human input/output capability. I am currently designing in-car infotainment interfaces, wearable devices and commercial packaging that utilise novel printed tactile actuators and touch sensors. My recent research has looked at the real-world impact of virtual reality experiences, multimodal affective feedback designs and spatial auditory interfaces for visually impaired children. I have previously studied various forms of haptic interaction, including thermal feedback, ultrasonic haptic feedback and pressure-based input on mobile devices.

Employment

2014 – Present

Research Associate

School of Computing Science, University of Glasgow, UK

PRESTIGE project: I am designing haptic interfaces using novel printed tactile actuators across multiple domains: in-car infotainment systems, solar-powered activity trackers, and commercial product packaging. This project aims to achieve commercial readiness, so I am collaborating closely with industrial partners to create pragmatic and value-adding interfaces.

Populations project: I was responsible for UI design, and collaborated with others in qualitative user research, on a pilot Smart Campus deployment: phone applications that detect Bluetooth beacons, localising an individual in a University building. This provides navigation or social features to users, and space usage or occupancy data to building administrators.

VET project (Virtual Errands Test): The project was run to investigate the use of a Virtual Reality platform for the assessment and testing of people with cognitive impairment. I designed and ran an experiment on the effects of amplified movements on object interaction, to determine if large virtual spaces can be used for assessment when limited home/institution space is available.

ABBI project (Audio Bracelet for Blind Interaction): The project investigated the use of a wrist-worn audible bracelet to improve spatial cognition in visually impaired children. I investigated audio designs and activities intended to improve awareness of, and reaching for, objects in the environment, balancing comfort, enjoyment and accurate localisation.

Independent research: During this time, I have also pursued independent research activities into affective feedback designs, to expand social and emotional expression in HCI. I championed novel thermal feedback designs in combination with vibrotactile and visual feedback, seeking to learn inherent interpretations of signals and utilise implicit or universal interface design. With the advent of commercial VR devices, I have also recently been researching the cognitive, emotional and behavioural effects VR experiences have on users, and so how media ratings bodies, content creators and researchers can appropriately describe or create safe and beneficial experiences.

2012 – 2014

Research Assistant

School of Computing Science, University of Glasgow, UK

UltraTouch project: I investigated the use of contact-free, mid-air tactile feedback for HCI using ultrasonic sound waves. I researched the perceptual characteristics of ultrasonic haptics, including localisation, movement, spatial resolution and detection thresholds.

2008 – 2009 *OpenInterface project*: I assisted in the design, prototype and integration of novel user interfaces, and the maintenance of an interface repository

Nov 11 – Jan 12 **Research Internship**
Nokia Research Centre, Helsinki, Finland
I joined Nokia's Organic User Interface research group and led a research project into a novel flexible interaction device, measuring the accuracy and comfort of bending devices of varying rigidity.

Teaching

2018 **Assistant Lecturer – PGT Human-Computer Interaction: Design & Evaluation**
I taught lectures on experimental design and hypothesis testing/statistical analysis.

2015, 2016 **Assistant Lecturer – Level 4 Human-Computer Interaction**
I taught lectures on haptics, experimental design and media space and privacy. I contributed new course content to the haptics and experimental design lectures to keep them up-to-date.

2014 **Assistant Lecturer – Level 4 MobileHCI**
I taught lectures on user requirements, evaluation design and location-based systems.

Funding

2014 **Nokia Research Grant – £13,000**
Brewster, S. & Wilson, G. "Thermal Feedback for Novel Forms of Interaction"

Student Supervision

MSc 3 students supervised, 2 co-supervised (1 in conjunction with Heriot-Watt University)

BSc 3 students supervised, 2 co-supervised (1 in conjunction with Heriot-Watt University)

Education

2009 – 2013 **PhD Human-Computer Interaction**
School of Computing Science, University of Glasgow
Thesis: "Using Pressure Input and Thermal Feedback to Broaden Haptic Interaction with Mobile Devices"

2007 – 2008 **MSc Information Technology (with Distinction)**
Department of Computing Science, University of Glasgow
Dissertation: "Tactile Geiger Counter for Ubiquitous Computing"

2001 – 2005 **BA (Hons) Psychology (Second Class Upper Division)**
Department of Psychology, University of Strathclyde
Dissertation: "Self-Regulation of Attention Following Task Failure"

Research Community Involvement

Conference Organisation *Associate Chair*: ASSETS (2018), CHI Late-Breaking Work (2016), MobileHCI (2014)
Posters & Demo Co-chair: ASSETS (2018)
Posters Chair: CHI (2019)

Conference Reviewing ACM: CHI, DIS, ICMI, ISS, MobileHCI, TEI, TVX, UIST
IEEE: Haptics Symposium, World Haptics
IFIP: INTERACT
Other: Eurohaptics, Graphics Interface

Journal Reviewing

ACM: Transactions on Accessible Computing, Transactions on HCI
Elsevier: Int. J. Human-Computer Studies
IEEE: Transactions on Haptics
Oxford Academic: Interacting with Computers
Taylor & Francis: Applied Ergonomics; Ergonomics

Invited Talks & Presentations

- 2016** **University of Dundee**
Invited member of “Life After the Viva” panel, PhD Symposium
- 2014** **TEDx Glasgow**
Demonstration: “Thermal Feedback for Mobile Devices”
- 2013** **Glasgow Caledonian University**
Talk: “Using Pressure Input and Thermal Feedback to Augment Haptic Interaction with Mobile Devices”.

Organisational Activities

- 2017 –** **Ethics Committee – College of Science & Engineering**
I am a member of the ethical approval committee for experimental research proposals.
- 2012 – 2014** **Glasgow Interactive Systems Group (GIST) Seminar Coordinator**
I was responsible for the organisation of visiting speakers and seminars for the Glasgow Interactive Systems (GIST) research group. I selected and contacted speakers, assisting in travel and financial organisation and disseminating information to interested parties.

Publications

37 publications, 461 citations

- **Wilson, G.***, McGill*, M., Jamieson, M., Williamson, J. & Brewster, S. (2018) “Object Manipulation in Virtual Reality Under Increasing Levels of Translational Gain”, *Proceedings of ACM CHI 2018*, April 21-26, Montreal, Canada. *Both authors contributed equally to this work.
- Freeman, E., Anderson, R., Williamson, J., **Wilson, G.** & Brewster, S. (2017) “Textured Surfaces for Ultrasound Haptic Displays”, *Proceedings of ICMI 17 Demos*, Glasgow, Scotland.
- **Wilson, G.** & Brewster, S. (2017) “Multi-moji: Combining Thermal, Vibrotactile & Visual Stimuli to Expand the Affective Range of Feedback”, *Proceedings of ACM CHI 17*, May 6-11, Denver, CO.
- **Wilson, G.**, Maxwell, H. & Just, M. (2017) “Everything’s Cool: Extending Security Warnings with Thermal Feedback”, *Proceedings of ACM CHI 17 Late-Breaking Work*, May 6-11, Denver, CO.
- Freeman, E., **Wilson, G.**, Brewster, S., Baud-Bovy, G., Magnusson, C. & Caltenco, H. (2017) “Audible Beacons and Wearables in Schools: Helping Young Visually Impaired Children Play and Move Independently”, *Proceedings of ACM CHI 17*, May 6-11, Denver, CO.
- Freeman, E., **Wilson, G.**, Vo, D-B., Ng, A., Politis, I. & Brewster, S. (2017) “Multimodal Feedback in HCI: Haptics, Non-Speech Audio and their Applications”, in Oviatt, S., Schuller, B., Cohen, P.R., Sonntag, D., Potamianos, G. & Krüger, A. (Ed.) *Handbook of Multimodal-Multisensor Interfaces*, Morgan-Claypool.
- **Wilson, G.**, Freeman, E. & Brewster, S. (16) “Multimodal Affective Feedback: Combining Thermal, Vibrotactile, Audio & Visual Signals”, *Proceedings of ICMI 16*, Nov 12-16, Tokyo, Japan.
- Freeman, E., **Wilson, G.** & Brewster, S. (2016) “Towards a Multimodal Adaptive Lighting System for Visually Impaired Children”, *Proceedings of ICMI 16*, Nov 12-16, Tokyo, Japan.
- **Wilson, G.** & Brewster, S. (2016) “Using Dynamic Audio Feedback to Support Peripersonal Reaching in Young Visually Impaired People”, *Proceedings of ACM ASSETS 16*, Oct 24-6, Reno, NV. Best Paper Finalist 🏆

- Freeman, E., **Wilson, G.** & Brewster, S. (2016) “Automatically Adapting Home Lighting to Assist Visually Impaired Children”, *Proceedings of NordiCHI 16*, Oct 23-27, Gothenburg, Sweden.
- **Wilson, G.**, Dobrev, D. & Brewster, S. (2016) “Hot Under the Collar: Mapping Thermal Feedback to Dimensional Models of Emotion”, *Proceedings of ACM CHI 16*, May 7-12, San Jose, CA.
- **Wilson, G.**, Romeo, P. & Brewster, S. (2016) “Mapping Abstract Visual Feedback to a Dimensional Model of Emotion”, *Proceedings of ACM CHI 16 Late-Breaking Work*, May 7-12, San Jose, CA.
- Freeman, E., Vo, D.-B., **Wilson, G.**, Shakeri, G. & Brewster, S. (2016) “Towards Mid-Air Haptic Widgets”, *CHI 16 Workshop on Mid-Air Haptics and Displays*, 8th May, San Jose, CA.
- **Wilson, G.** & Brewster, S. (2015) “Using Dynamic Audio Feedback to Support Peripersonal Reaching in Visually Impaired People”, *Proceedings of ACM ASSETS 15 Demonstrations*, Oct 26-28, Lisbon, Portugal.
- Feng, S., **Wilson, G.**, Brewster, S. & Ng, A. (2015) “Investigating Pressure-based Interactions with Mobile Phones While Encumbered and Walking”, *Proceedings of ACM MobileHCI 15*, Aug 24-27, Copenhagen, Denmark.
- Magnusson, C., Caltenco, H., Finocchietti, S., Cappagli, G., **Wilson, G.** & Gori, M. (2015) “What Do You Like? Early Design Explorations of Sound and Haptic Preferences”, *Proceedings of ACM MobileHCI 15 Posters*, Aug 24-27, Copenhagen, Denmark.
- **Wilson, G.**, Davidson, G. & Brewster, S. (2015) “In the Heat of the Moment: Interpretations of Thermal Feedback During Interaction”, *Proceedings of ACM CHI 15*, Apr 18-23, Seoul, South Korea.
- **Wilson, G.**, Brewster, S., Caltenco, H., Magnusson, C., Finocchietti, S., Baud-Bovy, G. & Gori, M. (2015) “Effects of Sound Type on Recreating the Trajectory of a Moving Source”, *Proceedings of ACM CHI 15 Extended Abstracts*, Apr 18-23, Seoul, South Korea.
- Finocchietti, S., Cappagli, G., Baud-Bovy, G., Magnusson, C., Caltenco, H., **Wilson, G.**, et al. (2015) “ABBI, a New Technology for Sensory-Motor Rehabilitation of Visual Impaired People”, *Proceedings of ICEAPVI 15*, Feb 12-14, Athens, Greece.
- **Wilson, G.**, Carter, T., Subramanian, S. & Brewster, S. (2014) “Perception of Ultrasonic Haptic Feedback on the Hand: Localisation and Apparent Motion”, *Proceedings of ACM CHI 14*, Apr 26-May 1, Toronto, Canada.
- **Wilson, G.**, Brewster, S. & Halvey, M. (2013) “Towards Utilising One-Handed Multi-digit Pressure Input”, *Proceedings of ACM CHI 13 Works-in-Progress*, Apr 27-May 2, Paris, France.
- Halvey, M., **Wilson, G.** & Brewster, S. (2013) “Perception of Thermal Stimuli for Continuous Interaction”, *Proceedings of ACM CHI 13 Works-in-Progress*, Apr 27-May 2, Paris, France.
- **Wilson, G.**, Brewster, S., Halvey, M. & Hughes, S. (2013) “Thermal Feedback Identification in a Mobile Environment”, *Proceedings of HAID 13*, Apr 18-19, Daejeon, South Korea.
- **Wilson, G.**, Freeman, E., Carter, T., Seah, S.A., Brewster, S. & Subramanian, S. (2013) “Ultrasonic Haptic Feedback for Gestural Interfaces using a Moveable Hand-Mounted Array”, *IEEE WorldHaptics 13 Demonstrations*, Apr 14-17, Daejeon, South Korea.
- Kildal, J. & **Wilson, G.** (2012) “Feeling It: The Roles of Stiffness, Deformation Range and Feedback in the Control of Deformable UI”, *Proceedings of ICMI 12*, Oct 22-26, Santa Monica, CA.
- **Wilson, G.**, Brewster, S., Halvey, M. & Hughes, S. (2012) “Thermal Icons: Evaluating Structured Thermal Feedback for Mobile Interaction”, *Proceedings of ACM MobileHCI 12*, Sept 21-24, San Francisco, CA. Awarded Honourable Mention 🏆
- Halvey, M., Henderson, M., Brewster, S. & **Wilson, G.** (2012) “Augmenting Media with Thermal Stimulation”, *Proceedings of HAID 12*, Aug 23-24, Lund, Sweden.
- **Wilson, G.**, Hannah, D., Brewster, S. & Halvey, M. (2012) “Investigating One-Handed Multi-digit Pressure Input for Mobile Devices”, *Proceedings of ACM CHI 12 Works-in-Progress*, May 5-10, Austin, TX.
- Halvey, M., **Wilson, G.**, Brewster, S. & Hughes, S. (2012) “ “Baby It’s Cold Outside”: The Influence of Ambient Temperature & Humidity on Thermal Feedback”, *Proceedings of ACM CHI 12*, May 5-10, Austin, TX.
- Hannah, D., Halvey, M., **Wilson, G.** & Brewster, S. (2012) “Investigating Gestural and Pressure Interaction with a 3D Display”, *Proceedings of MMM 12*, January 4-6, Klagenfurt, Austria.
- Halvey, M., **Wilson, G.**, Vazquez-Alvarez, Y., Brewster, S. & Hughes, S. (2011) “The Effect of Clothing on Thermal Feedback Perception”, *Proceedings of ICMI 11*, November 14-18, Alicante, Spain.

- **Wilson, G.**, Brewster, S., Halvey, M., Crossan, A. & Stewart, C. (2011) “The Effects of Walking, Feedback and Control Method on Pressure-Based Interaction”, *Proceedings of MobileHCI 11*, Aug 30-Sept 2, Stockholm, Sweden. Awarded Honourable Mention 🏆
- Hannah, D., Halvey, M., **Wilson, G.** & Brewster, S. (2011) “Using Multimodal Interactions for 3D Television and Multimedia Browsing”, *Proceedings of EuroITV 11*, June 29-July 1, Lisbon, Portugal.
- **Wilson, G.**, Halvey, M., Brewster, S & Hughes, S. (2011) “Some Like it Hot? Thermal Feedback for Mobile Devices”, *Proceedings of ACM CHI 11*, May 7-12, Vancouver, BC.
- **Wilson, G.**, Brewster, S. & Halvey, M. (2011) “The Effects of Walking and Control Method on Pressure-Based Interaction”, *Proceedings of ACM CHI 11 Works-in-Progress*, May 7-12, Vancouver, BC.
- **Wilson, G.**, Stewart, C. & Brewster, S. (2010) “Pressure-Based Menu Selection for Mobile Devices”, *Proceedings of MobileHCI 10*, September 7-10, Lisbon, Portugal.
- Ramsay, A., McGee-Lennon, M., **Wilson, G.**, Gray, S., Gray, P. & De Turenne, F. (2010) “Tilt and Go: Exploring Multimodal Mobile Maps in the Field”, *Journal of Multimodal User Interfaces*, 3, pp. 167-177.

Awards

Best Paper Finalist	Wilson, G. & Brewster, S. “Using Dynamic Audio Feedback to Support Peripersonal Reaching in Young Visually Impaired People”, <i>ASSETS 2016</i>
Honourable Mention	Wilson, G. <i>et al.</i> “Thermal Icons: Evaluating Structured Thermal Feedback for Mobile Interaction”, <i>MobileHCI 2012</i> Wilson, G. <i>et al.</i> “The Effects of Walking, Feedback and Control Method on Pressure-Based Interaction”, <i>MobileHCI 2011</i> .
Peer Review	ACM CHI Special Recognitions for Reviewing ACM ICMI Outstanding Reviewer
Nominations	IEEE Eurohaptics PhD Award 2013