RESEARCH STATEMENT

I am deeply interested in creating smooth, natural interactions between users and technology. I aim to work at the interface between novel devices and people, in order to enable users to feel at ease using the technology. I value techniques that feel natural and almost invisible to the user. To do so, I ground my work in a deep understanding of the way the human body moves and the way we use it to achieve our daily tasks.

My PhD research has been systematically focused on creating eye-based interactions that are intuitive and do not force the user to perform any usual movements with their eyes. I have been looking at the eye movements people do in their everyday life and integrated them into seamless interaction techniques to enhance immersion and system reactivity, such as video game characters that respond to the player’s eye movements.

PROFESSIONAL EXPERIENCE

2015 - present    Thalmic Labs (Advanced R&D team), Kitchener, ON, Canada
Wearable Interaction Researcher
- Survey relevant literature for the R&D projects and synthesize relevant information to inform the UX, hardware, software and design teams
- Develop hardware and software prototypes to showcase proof-of-concept and evaluate feasibility
- Conduct user studies to provide quantitative and qualitative feedback on prototypes

2013 - 2014 (7 months)    Nokia Research Center (Interaction Ecologies Group), Sunnyvale, CA, USA
Research Scientist (intern)
Theme: Research on the potential of eye-tracking for interaction with wearable displays
- Built eye-tracking hardware prototypes
- Implemented novel interaction techniques using eye and head movement
- Conducted user studies to investigate the usability and efficiency of the techniques
- Regular meetings with the Design and Engineering teams
- Three patents filed

2010 - 2015 (4.5 years)    Lancaster University (Human-Computer Interactions Group), UK
PhD Researcher
Theme: Movements of the eyes as means of interaction with technology.
Main focus: developing interaction techniques that use the natural movements and behaviours of the eyes.
- Development of machine learning algorithms tailored to detect movements in real time
- Creation of an eye-based interaction technique, “Pursuits”, that bypasses eye tracking’s main blocking point: calibration of the eye tracker. Evaluation of the technique, development of example applications, lab usability studies, three field studies “in the wild”.

- Use of the previous technique to improve existing calibration procedures.
- Identification of the effects of the eyes in the physical world. Implementation of these effects into interaction techniques to explore their potential for human-computer interaction.
- Implementation of several video games (Unity3D) and conduction of studies to collect qualitative data about gameplay experience, ease of use, immersion and potential for the eyes as game controllers.
- Use of understudied eye movements and proof that seamless, instinctive eye-based interactions are feasible.
- Mentoring of masters students and spin-off projects from this PhD research

2010  
e(ye)BRAIN, Ivry, France  
Research Scientist (intern)  
*Theme: Research on eye movement detection algorithms to detect neurological diseases*
- Acquired solid background in the brain’s visual process and the effect of neurological diseases on eye movements
- Researched, created and implemented saccade detection algorithms
- Developed and integrated a new algorithm into the company’s software for use by clinicians

2009  
University of Guadalajara (Institute of Neurosciences), Mexico  
Software Developer  
- Developed IT solutions for neuroscience researchers
- Surveyed the researchers’ needs and translated them into interfaces and code

2008  
Ramboll IT, Virum, Denmark  
Software Developer (intern)  
- Adapted the design of a software interface to be displayed on a PDA

**EDUCATION**

2010 - 2015  
Lancaster University, UK  
PhD, Human-Computer Interaction  
Dissertation: “Exploring Eye Movements for Natural Human-Computer Interaction”.  
Advisors: Hans Gellersen, Andreas Bulling.

2009 - 2010  
University Paul Sabatier, Toulouse, France  
M.Sc, Artificial Intelligence (Hons)  
Thesis: “Oculo-motoricity for early neurological disorder diagnosis”.  
Advisor: Mickael Maillard.

2005 - 2010  
National Institute of Applied Sciences, Toulouse, France  
M.Sc, Software engineering  
Joint Thesis with University Paul Sabatier  
Exchange student: semester in DTU (Denmark, 2008), semester in UdG (Mexico, 2009)
AWARDS

Lancaster University Dean’s Award for Excellence in PhD Studies (First year category – 2011)

SCHOLARSHIPS

Ontario Centre of Excellence TalentEdge Fellowship - 2015
Lancaster University travel support grant - 2012
Lancaster University Faculty of Science and Technology Scholarship (2010 – 2013)

TEACHING ACTIVITIES

ADVISING
Mentoring of various M.Sc students during their thesis writing.
Co-supervised M.Sc student Ken Pfeuffer (Lancaster University, 2012)
Co-supervised B.Sc student Christian Weichel (Lancaster University 2011)

TEACHING ASSISTANT
B.Sc Software Development: academic year 2012-2013, academic year 2011-2012 (Intro to C and Java)

TALKS AND OUTREACH

STEM Ambassador: various volunteering activities in UK schools to increase children’s interest in scientific studies.
Mentor and judge at children engineering and robotic competitions in the UK and the USA.

INVITED TALKS
“Designing eye-based interfaces”, FXPAL, April 25th, 2014, Palo Alto, CA, USA.
“General Physiology of the eye”, Lancaster University, November 2010, Lancaster, UK.

DOCTORAL CONSORTIUM
“Eye Movements for Pervasive Applications”, UbiComp, September 2012, Pittsburgh, PA, USA.

RESEARCH COMMUNITY

ACM Student member

REVIEWER
Regular reviewer at CHI, UbiComp, ETRA, Journal of Eye Movement Research, MajesTIC, DIS, PETMEI

STUDENT VOLUNTEER
CHI 2014, UbiComp 2013, ETRA 2012, UbiComp 2011
PUBLICATIONS

**JOURNAL ARTICLES**


**CONFERENCE PAPERS**


**EXTENDED ABSTRACTS**


**POSTERS**

Melodie Vidal, *Improving the Detection of Eye Movements*, Faculty of Science and Technology Christmas Conference, December 2011, Lancaster, UK.

**WORKSHOP PAPERS**


**PATENTS**


**REFERRERS**

Stefan Alexander  
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Professor for Interactive Systems & Director of Research  
Infolab21, Lancaster University, UK  
hwg@comp.lancs.ac.uk

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Max Planck Institute for Informatics, Saarbrücken, Germany  
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Technicolor, Los Altos, CA  
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