Mélodie Vidal, PhD

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RESEARCH STATEMENT

I am passionate about 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 in empirical research.

My PhD has been systematically focused on creating eye-based interactions that are intuitive and do not force the user to perform any unusual 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 (6 months)
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 (4 months)
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 (5 months)
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-motricity 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: term in DTU (Denmark, 2008), term in UdG (Mexico, 2009)

AWARDS

AWARDS
Lancaster University Dean's Award for Excellence in PhD Studies (First year category – 2011)
Best Master Thesis of the National Institute of Applied Science (2010)

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
"Natural eye-based interfaces", U. Waterloo, February 26th, 2016, Waterloo, Canada.
"Natural eye-based interfaces", Thalmic Labs, March 2nd, 2015, Kitchener, Canada.
"Designing eye-based interfaces", FXPAL, April 25th, 2014, Palo Alto, CA, USA.
"Natural eye-based interfaces", Berkeley Institute of Design, January 28th, 2014, Berkeley, 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

Mélodie Vidal, Andreas Bulling and Hans Gellersen, *Pursuits: Spontaneous Eye-Based Interaction for Dynamic Interfaces*, SIGMOBILE Mobile Computing and Communications Review, October 2014.

Mélodie Vidal, Jayson Turner, Andreas Bulling and Hans Gellersen, *Wearable Eye Tracking for Mental Health Monitoring*, Computer Communications, November 2011.

CONFERENCE PAPERS

Mélodie Vidal, Remi Bismuth, Andreas Bulling and Hans Gellersen, *The Royal Corgi: Exploring Social Gaze Interaction for Immersive Gameplay*, Proceedings of CHI, April 2015, Seoul, Korea.

Kent Lyons, Seungwook W. Kim, Shigeyuki Seko, David H. Nguyen, Audrey Desjardins, Mélodie Vidal, David Dobbelstein and Jeremy Rubin, *Loupe: A Handheld Near-Eye Display*, Proceedings of UIST, October 2014, Honolulu, USA.

Mélodie Vidal, David H. Nguyen and Kent Lyons, *Looking At or Through? Using Eye Tracking to Infer Attention Location for Wearable Transparent Displays*, Proceedings of ISWC, September 2014, Seattle, USA.

Ken Pfeuffer, Mélodie Vidal, Jayson Turner, Andreas Bulling and Hans Gellersen, *Pursuit Calibration: Making Gaze Calibration Less Tedious and More Flexible*, Proceedings of UIST, October 2013, St Andrews, UK.

Mélodie Vidal, Andreas Bulling and Hans Gellersen, *Pursuits: Spontaneous Interaction with Displays based on Smooth Pursuit Eye Movement and Moving Targets*, Proceedings of UbiComp, September 2013, Zurich, Switzerland.

Mélodie Vidal, Andreas Bulling and Hans Gellersen, *Detection of Smooth Pursuits Using Eye Movement Shape Features*, Proceedings of the Symposium on Eye-Tracking Research & Applications (ETRA), March 2012, Santa Barbara, CA, USA.

EXTENDED ABSTRACTS

Mélodie Vidal and Rémi Bismuth, *The Royal Corgi: A Game of Social Gaze*, Proceedings of ACE, November 2014, Madeira, Portugal (Game Design Competition).

Mélodie Vidal, *Shynosaurs: A Game of Attention Dilemma*, Proceedings of CHIPlay, October 2014, Toronto, Canada (Student Game Design Competition).

Mélodie Vidal, Ken Pfeuffer, Andreas Bulling and Hans Gellersen, *Pursuits: Eye-Based Interactions with Moving Targets*, Proceedings of CHI EA Interactivity, May 2013, Paris, France (Demo).

POSTERS

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

Melodie Vidal, Jayson Turner, Yanxia Zhang, *Wearable Eye Tracking for Context Inference and Analysis*, Faculty of Science and Technology Christmas Conference, December 2010, Lancaster, UK.

WORKSHOP PAPERS	Mélodie Vidal, Andreas Bulling and Hans Gellersen, *Analysing EOG Signal Features for the Discrimination of Eye Movements with Wearable Devices*, Proceedings of the 1st International Workshop on Pervasive Eye Tracking and Mobile Eye-Based Interaction (PETMEI), September 2011, Beijing, China.

PATENTS

Mélodie Vidal, *Display of Information on a Head Mounted Display*, PCT/ US2014/035207, filed April 23rd, 2014.

David Nguyen, Mélodie Vidal, Audrey Desjardins, *Body limits as Controls for Information*, PCT/ US2013/072770, filed December 3rd, 2013.

Kent Lyons, David Nguyen, Shigeyuki Seko, Seung Wook Kim, Mélodie Vidal, Audrey Desjardins, David Dobbelstein, *Pendant Display Device*, 61/879063, filed September 17th, 2013.

REFERRERS

Stefan Alexander
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Prof. Hans Gellersen
Professor for Interactive Systems & Director of Research
Infolab21, Lancaster University, UK
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Dr. Andreas Bulling
Research Group Leader
Max Planck Institute for Informatics, Saarbrücken, Germany
andreas.bulling@acm.org

Dr. Kent Lyons
Principal Research Scientist
Technicolor, Los Altos, CA
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