Curriculum Vitae

Jesse Hoey

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Summary Biography

Dr. Jesse Hoey is an associate professor in the David R. Cheriton School of Computer Science at the University of Waterloo, where he leads the Computational Health Informatics Laboratory (CHIL). He is also an adjunct scientist at the Toronto Rehabilitation Institute in Toronto, Canada, where he is co-leader of the AI and Robotics Research Team. He works on problems in computational social science, probabilistic and decision theoretic automated reasoning, affective computing, rehabilitation science, and ubiquitous computing. Much of his work has focussed on developing systems to help persons with a cognitive disability (e.g. Alzheimer's disease) to engage in activities of daily living. His recent funded research includes a multinational grant from the Trans-Atlantic Partnership to investigate social coordination in online collaborative networks. He was the program chair for the 10th EAI International Conference on Pervasive Computing Technologies for Healthcare, and the chair of the Alzheimer's Association International Society to Advance Alzheimer's Research and Treatment (ISTAART) Technology Professional Interest Area (TPIA). He is a Network Investigator for the AGEWELL Network of Centers of Excellence. He has won awards from the American Sociological Association, Microsoft, the AAAI, and the International Association for Pattern Recognition. More information on Dr. Hoey can be found at his website www.cs.uwaterloo.ca/ jhoey.

Education

Ph.D. Computer Science, University of British Columbia, Vancouver, Canada **1997-2004**

M.Sc. Physics/Oceanography, University of British Columbia, Vancouver, Canada **1992-1994**

B.Sc. Physics (Honours), McGill University, Montreal, Canada **1989-1992**

Positions Currently Held

Associate Professor, School of Computer Science, University of Waterloo **2013-**

Adjunct Scientist, Toronto Rehabilitation Institute, Toronto **2006-**

Positions Previously Held

Visiting Professor, Institut de Recherche en Informatique et Automatique (INRIA), France **2014-2015**

Assistant Professor, School of Computer Science, University of Waterloo **2010-2013**

Lecturer (Assistant Professor), School of Computing, University of Dundee **2006-2010**

Postdoctoral Fellow, Department of Computer Science and Department of Occupational Therapy and (cross-appointed), University of Toronto **2004-2006**
Member: Intelligent Assistive Technology and Systems Laboratory (IATSL).
Supervisors: Prof. Craig Boutilier and Dr. Alex Mihailidis.

Awards and Citations

American Sociological Association Section on Social Psychology
Outstanding Recent Contribution in Social Psychology Paper Award **2017**
For the Paper: Tobias Schröder, Jesse Hoey and Kimberly B. Rogers. Modeling dynamic identities and uncertainty in social interactions: Bayesian affect control theory. American Sociological Review.

American Sociological Association Section on Mathematical Sociology **Outstanding Article Award** **2017**
For the paper: Tobias Schröder, Jesse Hoey and Kimberly B. Rogers. Modeling dynamic identities and uncertainty in social interactions: Bayesian affect control theory. American Sociological Review.

Cheriton Faculty Fellow **05/2014-04/2017**
School of Computer Science, University of Waterloo

Highly accessed rating assigned by BMC Geriatrics **2009**
For the paper : Alex Mihailidis, Jennifer N. Boger, Tammy Craig, and **Jesse Hoey**. The COACH prompting system to assist older adults with dementia through handwashing: An efficacy study. *BMC Geriatrics*, 8 (28), 2008.

Microsoft/AAAI **Distinguished Contribution Award** **2009**
at IJCAI 2009 Workshop on Intelligent Systems for Assisted Cognition ($2,500 USD Prize)

The COACH - Named **"Solution of the Year"** 2007 by Advanced Imaging Magazine. **2008**

The COACH - Named **top 20** Science & Medicine Stories of the Year 2007 - The Toronto Star. **2008**

International Association for Pattern Recognition (IAPR) **Best Paper Award** **2007**
For the paper *Assisting Persons with Dementia during Handwashing Using a Partially Observable Markov Decision Process* at the International Conference on Vision Systems, Bielefeld, Germany, (€500 cash prize).

Canesta^{TM} Vision Contest **Grand Prize Winner** **2005**
Innovative Application of Canesta's electronic perception technology, *Wheelchair collision obstacle avoidance* ($10,500 USD cash prize).

Canesta^{TM} Vision Contest **Winner** (Phase One) **2005**
Innovative Application of Canesta's electronic perception technology, *Wheelchair collision avoidance using 3D sensors* ($7,500 USD In-kind prize).

First place, 2001 *Hors D'œuvres Anyone?* Mobile Robot Competition. **2001**
Seattle, WA, August, 2001.

Teaching Assistant Award, Department Computer Science, UBC. **1998,1999,2000**

Horace Watson Medal. McGill University, Montreal, Canada. **1992**
Awarded for highest academic standing in Honours Physics.

Research Grants

Principal Investigator/Co-Investigator (Current)

- Trans-Atlantic Platform (NSERC and SSHRC) *Digging into Data Challenge* **03/2017-02/2020**
  Principal Investigator and Overall Project Lead: *THEMIS.COG: Theoretical and Empirical Modeling of Identity and Sentiments in Collaborative Groups*
  Co-Investigators: Mei Nagappan (Waterloo), Kimberly B. Rogers (Dartmouth College, USA), Tobias Schröder, Potsdam Univ. of Applied Sciences, Germany
  amount: $199864 CND (total grant amount accross all partners $\approx$ $800,000 CND)

- National Sciences and Engineering Council of Canada (NSERC) *Discovery Grant* **05/2016-04/2021**
  Principal Investigator: *ATSA-ESI: Assistive Technology Supporting Aging with Emotional and Social Intelligence*
  amount: $43,000/year ($215000 total) CND
- Canadian Consortium on Neurodegeneration and Aging (CCNA) **04/2015 - 03/2018**
  Principal Investigator. *Affective Computing for Social Connectedness.*
  PIs: Jesse Hoey, Hélène Pigot, Alex Mihailidis
  amount: $69,000 CAD.
- Networks of Centres of Excellence (NCE) **04/2015 - 03/2019**
  Co-Investigator. *Aging gracefully across environments using technology to support wellness, engagement, and long life (AGE-WELL).*
  Nominated PI: Mihailidis, Alex. PI: Sixsmith, Andrew.
  Co-Investigators: Jesse Hoey and 48 others.
  amount: $36,605,194 CAD.
- Networks of Centres of Excellence (NCE) **04/2015 - 03/2016**
  Network Investigator. *DIY-AIDE AGE-WELL NCE Inc.*
  PIs: Jesse Hoey, Hélène Pigot
  amount: $256,100 CAD.
- American Alzheimer's Association *Everyday Technologies for Alzheimer's Care* **01/2015-12/2017**
  co-Investigator: *Affective and Cognitive Technologies for Assistance in the Home ACT@HOME*
  amount: $199,600 USD

Publications

Book

- Alex Mihailidis, Jennifer N. Boger, Jesse Hoey and Tizneem Jiancaro. Zero Effort Technologies: Considerations, Challenges, and Use in Health, Wellness, and Rehabilitation. Morgan Claypool, Synthesis Lectures on Assistive, Rehabilitative, and Health-Preserving Technologies, August 2011

Volumes Edited

- Jesse Hoey, Stephen McKenna, and Emanuele Trucco, editors. Proc. of the 22^{nd} British Machine Vision Conference (BMVC), 2011. Published by the British Machine Vision Association.
- Enrique Sucar, Eduardo Morales and Jesse Hoey (eds). Decision Theory Models for Applications in Artificial Intelligence: Concepts and Solutions. IGI Global, 2012.
- Liming Chen, Chris Nugent, Jesse Hoey and Jit Biswas (eds). Activity Recognition in Pervasive Intelligent Environments Book Series: Atlantis Ambient and Pervasive Intelligence. 2011.
- Stephen McKenna and Jesse Hoey, editors. Annals of the British Machine Vision Association Special Issue on MIUA 2008. Vol 2009, Issues 1-8. A collection of the best papers from MIUA 2008.
- Stephen McKenna and Jesse Hoey, editors. Proceedings of the Twelfth Annual Conference on Medical Image Understanding and Analysis (MIUA) 2008. Published by the British Machine Vision Association (BMVA). ISBN 1901725359.

Book Chapters

- Mihailidis, A., Boger, J., Czarnuch, S., Nagdee, T., and **Hoey, J.** (2012). Ambient Assisted Living Technology to Support Older Adults with Dementia with Activities of Daily Living: Key Concepts and the State of the Art. In Juan Carlos Augusto, Michael Huch, Achilles Kameas, Julie Maitland, Paul McCullagh, Jean Roberts, Andrew Sixsmith, Reiner Wichert (Eds.), *Handbook of Ambient Assisted Living - Technology for Healthcare, Rehabilitation and Well-being*. Amsterdam, The Netherlands: IOS Press. ISBN: 978-1-60750-836-6.

- Jesse Hoey, Pascal Poupart, Craig Boutilier, and Alex Mihailidis. POMDP models for Assistive Technology. In Enrique Sucar, Eduardo Morales and Jesse Hoey (eds). Decision Theory Models for Applications in Artificial Intelligence: Concepts and Solutions. IGI Global, 2012.
- Alan F. Newell, Alex Carmichael, Peter Gregor, Norman Alm, Annalu Waller, Vicki L. Hanson, Graham Pullin, and Jesse Hoey. Information Technology for Communication and Cognitive Support. In *Human-Computer Interaction Handbook, 3rd Edition*, Taylor & Francis, 2012
- James J. Little Jesse Hoey, and Pantelis Elinas. Visual Capabilities in an Interactive Autonomous Robot. In H.I. Christensen and H.-H. Nagel (Eds.): *Cognitive Vision Systems*, LNCS 3948, pages 295-312, Springer 2006.

Invited Contributions

- James Tung, Heather Snyder, Jesse Hoey, Alex Mihailidis, Maria Carrillo and Jesus Favela Everyday Patient-Care Technologies for Alzheimer's Disease. Pervasive Computing, 12, 4, Oct-Dec, 2013
- Stephen McKenna, *Jesse Hoey* and Emanuele Trucco Objects, Actions, Places. Guest Editorial, *International Journal of Computer Vision*, 106, 3, February, 2014.

Journal Articles

- Alexandra König, Linda E Francis, Jyoti Joshi, Julie M. Robillard and Jesse Hoey. Qualitative study of affective identities in dementia patients for the design of cognitive assistive technologies. Journal of Rehabilitation and Assistive Technologies Engineering. 2017
- Shehroz Khan, Michelle E. Karg, Dana Kulic and Jesse Hoey Detecting Falls with X-Factor Hidden Markov Models. Applied Soft Computing, 2017
- Shehroz Khan and Jesse Hoey Review of fall detection techniques: A data availability perspective. Medical Engineering and Physics, 39, 2017
- Tobias Schröder, Jesse Hoey and Kimberly B. Rogers. Modeling dynamic identities and uncertainty in social interactions: Bayesian affect control theory. American Sociological Review 81(4): p828-855, 2016. **Winner of (1) American Sociological Association Section on Social Psychology "Outstanding Recent Contribution in Social Psychology Paper Award" (2016) and (2) American Sociological Association Section on Mathematical Sociology "Outstanding Article Award" (2016)**
- Stefan Teipel, Claudio Babiloni, Jesse Hoey, Jeffrey Kaye, Thomas Kirste, and Oliver K. Burmeister Information and communication technology solutions for outdoor navigation in dementia. Alzheimer's and Dementia, 12(6) June 2016.
- Jesse Hoey, Tobias Schröder and Areej Alhothali. Affect control processes: Intelligent affective interaction using a partially observable Markov decision process. Artificial Intelligence, 230, 2016.
- Marek Grześ, Pascal Poupart, Xiao Yang, and Jesse Hoey. Energy Efficient Execution of POMDP Policies. *IEEE Transactions on Cybernetics*, vol.45, no.11, pp.2484-2497, Nov 2015.
- George Zhu, Dan Lizotte and Jesse Hoey. Scalable Approximate Policies for Markov Decision Process Models of Hospital Elective Admissions. *Artificial Intelligence in Medicine*, 61, 1, May 2014.
- Christian Peters, Thomas Hermann, Sven Wachsmuth and Jesse Hoey. Automatic task assistance for people with cognitive disabilities in brushing teeth - a user study with the TEBRA system. *IEEE Transactions on Accessible Computing*, 5 (4), March, 2014.
- Michelle E. Karg, Gentiane Venture, Jesse Hoey and Dana Kulić. Human Movement Analysis as a Measure for Fatigue: A Hidden Markov-Based Approach. *IEEE Transactions on Neural Systems and Rehabilitation Engineering*, 22, 3, May, 2014.
- Michelle E. Karg, Ali-Akbar Samadani, Rob Gorbet, Kolja Kuhnlenz , Jesse Hoey and Dana Kulić. Body Movements for Affective Expression: A Survey of Automatic Recognition and Generation. *IEEE Transactions on Affective Computing*, 4 (4), Oct-Dec 2013.

- Marek Grześ, Jesse Hoey, Shehroz Khan, Alex Mihailidis, Stephen Czarnuch, Dan Jackson, Andrew Monk. Relational Approach to Knowledge Engineering for POMDP-based Assistance Systems as a Translation of a Psychological Model. *International Journal of Approximate Reasoning*, Vol. 55 (1 - Part 1), pp.36-58, January 2014.
- Valerie Leuty, Jennifer N. Boger, Laurel Young, Jesse Hoey and Alex Mihailidis Engaging Older Adults with Dementia in Creative Occupations Using Artificially Intelligent Assistive Technology. *Assistive Technology*, 25 (2), pp. 72-79, 2012
- Liming Chen, Jesse Hoey, Chris D. Nugent, Diane Cook and Zhiwen Yu Sensor-Based Activity Recognition. IEEE Transactions on Systems, Man, and Cybernetics - Part C: Applications and Reviews, 42, 6, 2012
- Jesse Hoey, Craig Boutilier, Pascal Poupart, Patrick Olivier, Andrew Monk, and Alex Mihailidis. People, Sensors, Decisions: Customizable and Adaptive Technologies for Assistance in Healthcare. *ACM Transactions on Interactive Intelligent Systems Special issue on* **Highlights of the Decade**, 2 (4), Decemer 2012.
- Patricia Kan, Rajibul Huq, Jesse Hoey, Robby Goetschalckx and Alex Mihailidis The development of an adaptive upper-limb stroke rehabilitation robotic system. Journal of NeuroEngineering and Rehabilitation, 8, 33, 2011
- Jesse Hoey, Thomas Plötz, Dan Jackson, Andrew Monk, Cuong Pham, Patrick Olivier. Rapid specification and automated generation of prompting systems to assist people with dementia. *Pervasive and Mobile Computing*, 7, 3, June 2011.
- Jennifer N. Boger, Jesse Hoey, Kate Fenton, Tammy Craig and Alex Mihailidis. Using actors to develop technologies for older adults with dementia: A pilot study. *Gerontechnology*, 9 (4), 2010
- Alex Mihailidis, Scott Blunsden, Jennifer N. Boger, Brandi Richards, Krists Zutis, Laurel Young and Jesse Hoey Towards the Development of a Technology for Art Therapy and Dementia: Definition of Needs and Design Constraints. *The Arts in Psychotherapy*, 37 (4), 2010.
- Jesse Hoey, Pascal Poupart, Axel von Bertoldi, Tammy Craig, Craig Boutilier, and Alex Mihailidis. Automated Handwashing Assistance for Persons with Dementia Using Video and a Partially Observable Markov Decision Process. *Computer Vision and Image Understanding (CVIU)*, 114 (5), May 2010.
- Alex Mihailidis, Jennifer N. Boger, Tammy Craig, and Jesse Hoey. The COACH prompting system to assist older adults with dementia through handwashing: An efficacy study. BMC Geriatrics, 8 (28), 2008.
- Jasper Snoek, Jesse Hoey, Liam Stewart, and Richard Zemel. Automated Detection of Unusual Events on Stairs. *Image and Vision Computing (IMAVIS)* 27 (1-2), Jan. 2009.
- Alex Mihailidis, Jen Boger, Marcelle Candido, and Jesse Hoey. The use of an intelligent prompting system for people with dementia. *ACM Interactions*, 14 (4), pp.34-37, ACM Press, July+August 2007.
- Jesse Hoey and James J. Little. Value-Directed Human Behavior Analysis with Partially Observable Markov Decision Processes. *IEEE Transactions on Pattern Analysis and Machine Intelligence* (PAMI), 29 (7), pp.1118-1132, 2007.
- Pooja Viswanathan, Jennifer Boger, Jesse Hoey, Pantelis Elinas and Alex Mihailidis. The Future of Wheelchairs: Intelligent Collision Avoidance and Navigation Assistance, *Geriatrics and Aging*, 10(4):253-6, 2007.
- Alex Mihailidis, Pantelis Elinas, Jen Boger, and Jesse Hoey. An Intelligent Powered Wheelchair to Enable Mobility of Cognitively Impaired Older Adults: an Anticollision System. *IEEE Transactions on Neural Systems and Rehabilitation Engineering*, 15 (1) (2007), pp.136-143.
- Jen Boger, Jesse Hoey, Pascal Poupart, Craig Boutilier, Geoff Fernie, and Alex Mihailidis. A planning system based on Markov decision processes to guide people with dementia through activities of daily living. *IEEE Transactions on Information Technology in Biomedecine*, 10 (2), 323-333, 2006.

Peer-Reviewed Conference Articles

- Wasif Khan and Jesse Hoey How Different Identities Affect Cooperation. Proc.of the Humaine Association Conference on Affective Computing and Intelligent Interaction, San Antonio, TX, 2017
- Dan Wang and Jesse Hoey Hierarchical Task Recognition and Planning in Smart Homes with Partial Observability. Proc. 11th International Conference on Ubiquitous Computing and Ambient Intelligence, Philadelphia, PA, 2017
- Zhengkun Shang, Jyoti Joshi and Jesse Hoey Continuous Facial Expression Recognition for Affective Interaction with Virtual Avatar. IEEE International Conference on Image Processing, Beijing, China, 2017
- Joshua D.A. Jung, Jesse Hoey, Jonathan H. Morgan, Tobias Schröder and Ingo Wolf. Grounding Social Interaction with Affective Intelligence. *Proceedings of the Canadian Conference on AI*, Victoria, BC, 2016.
- Aarti Malhotra, Jesse Hoey, Alexandra König and Sarel van Vuuren. A study of elderly people's emotional understanding of prompts given by Virtual Humans. *Proc. International Conference on Pervasive Computing Technologies for Healthcare*, Cancun, Mexico, 2016.
- Shehroz Khan and Jesse Hoey. dtFall - Decision-Theoretic Framework to Report Unseen Falls. *Proc. International Conference on Pervasive Computing Technologies for Healthcare*, Cancun, Mexico, 2016.
- Alexandra König, Linda E. Francis, Aarti Malhotra and Jesse Hoey Defining affective Identities in elderly Nursing Home residents for the design of an emotionally intelligent cognitive assistant. Proc. International Conference on Pervasive Computing Technologies for Healthcare, Cancun, Mexico, 2016 (bibtex)
- Alexandra König, Aarti Malhotra, Jesse Hoey and Linda E. Francis Designing personalized prompts for a virtual assistant to support elderly care home residents. Proc. International Conference on Pervasive Computing Technologies for Healthcare, Cancun, Mexico, 2016
- Areej Alhothali and Jesse Hoey. Good News or Bad News: Using Affect Control Theory to Analyze Reader's Reaction Towards News Articles. In *Proc. of the 2015 Conference of the North American Chapter of the Association for Computational Linguistics - Human Language Technologies* (NAACL HLT), Denver, CO, June 2015.
- Nabiha Asghar and Jesse Hoey Intelligent Affect: Rational Decision Making for Socially Aligned Agents. In *Proc. of Uncertainty in Artificial Intelligence*, Amsterdam, July 2015
- Jesse Hoey and Tobias Schröder. Bayesian Affect Control Theory of Self. In *Proc.of AAAI Conference on Artificial Intelligence*, Austin, TX, Jan 2015.
- Luyuan Lin, Stephen Czarnuch, Aarti Malhotra, Lifei Yu, Tobias Schröder, and Jesse Hoey. Affectively Aligned Cognitive Assistance using Bayesian Affect Control Theory. In Proc. IWAAL, Belfast, UK, Dec. 2014.
- Marek Grzes, Pascal Poupart and Jesse Hoey Isomorph-free Branch and Bound Search for Finite State Controllers. In *Proceedings of International Joint Conference on Artificial Intelligence*, Beijing, China, 2013
- Marek Grzes, Pascal Poupart and Jesse Hoey Controller Compilation and Compression for Resource Constrained Applications. In *Proc. 3rd International Conference on Algorithmic Decision Theory*, LNAI 8176, Brussels, Belgium , 2013
- Jesse Hoey, Tobias Schröder and Areej Alhothali Bayesian Affect Control Theory. In *Proc.of the Humaine Association Conference on Affective Computing and Intelligent Interaction*, Geneva, Switzerland, 2013
- Marek Grzes and Jesse Hoey On the Convergence of Techniques that Improve Value Iteration. IN *Proceedings of International Joint Conference on Neural Networks (IJCNN)*. Dallas, USA, 2013.
- Michelle E. Karg, Wolfgang Seiberl, Jesse Hoey and Dana Kulic Human Movement Analysis: Extension of the F-Statistic to Time Series using HMM. In *Proc. International Conference on Systems, Man, and Cybernetics*, Manchester, 2013.

- Dmitry Pyryeskin, Mark Hancock and Jesse Hoey Comparing elicited gestures to designer-created gestures for selection above a multitouch surface. In *ACM International Conference on Interactive Tabletops and Surfaces (ITS)*, Boston, MA, 2012 (bibtex)
- Shehroz Khan, Jesse Hoey and Daniel Lizotte Bayesian Multiple Imputation Approaches for One-Class Classification. In *Proceedings of the 25th Canadian Conference on AI*, 7310, Toronto, Canada, 2012 (bibtex)
- Jesse Hoey, Xiao Yang, Eduardo Quintana and Jesus Favela LaCasa: Location And Context-Aware Safety Assistant. In *Proc. International Conference on Pervasive Computing Technologies for Healthcare*, San Diego, May, 2012
- Marek Grześ and Jesse Hoey. Analysis of Methods for Solving MDPs. In *Proc.* 11^{th} *International Conference on Autonomous Agents and Multiagent Systems (AAMAS)* (extended abstract), Valencia Spain, 2012.
- Jesse Hoey and Marek Grzes. Distributed Control of Situated Assistance in Large Domains with Many Tasks. In *Proceedings of the 21st International Conference on Automated Planning and Scheduling (ICAPS'11)*, June 2011 (primary author, acceptance rate: 39/108=36%)
- Marek Grzes and Jesse Hoey. Efficient Planning in RMAX. In *Proceedings of Tenth International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, 2011.
- Robby Goetschalckx, Jesse Hoey and Pascal Poupart. Continuous Correlated Beta Processes In *Proc. of* 22^{nd} *International Joint Conferences on Artificial Intelligence* (IJCAI), Barcelona, Spain, July 2011.
- Jesse Hoey, Krists Zutis, Valerie Leuty and Alex Mihailidis. A Tool to Promote Prolonged Engagement in Art Therapy: Design and Development from Art Therapist Requirements. In *Proceedings of the 12th International ACM SIGACCESS Conference on Computers and Accessibility*, Orlando, Florida, October, 2010 (primary author. acceptance rate)
- Krists Zutis and Jesse Hoey. Who's Counting?: Real-Time Blackjack Monitoring for Card Counting Detection. In *Proc. of Intl. Conference on Vision Systems (ICVS)*, Liege, Belgium, October 2009. (senior author, acceptance rate: 45/120=37%)
- Jesse Hoey, Axel von Bertoldi, Pascal Poupart and Alex Mihailidis. Assisting Persons with Dementia during Handwashing Using a Partially Observable Markov Decision Process In *Proc. of International Conference on Vision Systems (ICVS)*, Bielefeld, Germany, March 2007. (primary author. acceptance rate: 64/127 = 50% total, 26/127 = 20% oral, and **winner of the best paper award:** 1/127 = 0.8%)
- Jesse Hoey Tracking using Flocks of Features, with. Application to Assisted Handwashing. In *Proc. of British Machine Vision Conference*, Edinburgh, Scotland, September 2006 (primary author. acceptance rate: 127/420=30%)
- Jasper Snoek, Jesse Hoey, Liam Stewart and Richard Zemel. Automated Detection of Unusual Events on Stairs. in *Proc. of* 3^{rd} *Conference on Computer and Robot Vision*, Quebec, June 2006 (contributing author. acceptance rate: 47/89=53% total, 23/89=26% oral)
- Pascal Poupart, Nikos Vlassis, Jesse Hoey, and Kevin Regan. An Analytic Solution to Discrete Bayesian Reinforcement Learning. In *Proceedings of the* 23^{rd} *International Conference on Machine Learning (ICML)*, pages 697-704, Pittsburgh, Pennsylvania, USA, 2006. (contributing author. acceptance rate: 140/700 = 20%)
- Jesse Hoey and Pascal Poupart. Solving POMDPs with Continuous or Large Discrete Observation Spaces. In *Proc. of Intl. Joint Conference on Artificial Intelligence* (IJCAI), Edinburgh, July 2005. (primary author. acceptance rate 240/1330 =18% oral)
- Jen Boger, Pascal Poupart, Jesse Hoey, Craig Boutilier, Geoff Fernie, and Alex Mihailidis. A Decision-Theoretic Approach to Task Assistance for Persons with Dementia. In *Proc. of Intl. Joint Conference on Artificial Intelligence* (IJCAI), Edinburgh, Scotland, July 2005. (contributing author. acceptance rate 240/1330 =18% oral)
- Jesse Hoey and James J. Little. Value Directed Learning of Facial Displays. In Proc of IEEE *Conference on Computer Vision and Pattern Recognition* (CVPR), Washington, DC, June 2004. (primary author. acceptance rate: 206/870=30% total, 54/870=6% oral)

- Jesse Hoey and James J. Little. Decision Theoretic Modeling of Human Facial Displays. In Proc. of 8^{th} *European Conference on Computer Vision* (ECCV), Prague, CZ, May 2004. (primary author. acceptance rate: 190/555=34% total, 41/555=7% oral)
- Jesse Hoey and James J. Little. Bayesian Clustering of Optical Flow Fields. In Proc. of *Intl. Conference on Computer Vision* (ICCV), Nice, France, October 2003. (primary author. acceptance rate: 199/971=21% total)
- Jesse Hoey. Clustering Contextual Facial Display Sequences. In Proc. of *Intl. Conference on Automatic Face and Gesture Recognition* (FG), Washington, DC, May 2002. (primary author. acceptance rate: 30%)
- Pantelis Elinas, Jesse Hoey, Darrell Lahey, Jeff Montgomery, Don Murray, Stephen Se, and James J. Little Waiting with Jose, a vision based mobile robot. In Proc. *Intl. Conference on Robotics and Automation* (ICRA) Washington, DC, May 2002. (contributing author. acceptance rate 689/1168=59%)
- Jesse Hoey and James J. Little. Representation and recognition of complex human motion. In Proc. of *Intl. Conference on Computer Vision and Pattern Recognition* (CVPR), Hilton Head, SC, June 2000. (primary author. acceptance rate: 220/464=47% total)
- Robert St-Aubin, Jesse Hoey, and Craig Boutilier. APRICODD: Approximate policy construction using decision diagrams. In Proc. *Neural Information Processing Systems* (NIPS) 14, 2000. (primary author. acceptance rate $\approx$ 30%)
- Jesse Hoey, Robert St-Aubin, Alan Hu, and Craig Boutilier. (primary author. acceptance rate=30%) SPUDD: Stochastic planning using decision diagrams. In Proc. of *Uncertainty in Artificial Intelligence* (UAI), Stockholm, Sweden, 1999. (primary author. acceptance rate=77/151=51%)

Workshops and Posters

- Julie M. Robillard, Aaron W. Li, Shilpa Jacob, Dan Wang, Xin Zou, and Jesse Hoey. Co-Creating Emotionally Aligned Smart Homes Using Social Psychological Modeling. Proc. 4th international Workshop on Sensor-based Activity Recognition and Interaction (iWOAR), Rostock, Germany, September, 2017.
- Jyoti Joshi, Alexandra Konig, Zhengkun Shang, Julie M Robillard, Linda E. Francis and Jesse Hoey. Affectively Aligned Assistive Technology for Persons with Dementia. Society for Affective Science : Affective Computing Pre-Conferece, Boston, MA, 2017.
- Julie M Robillard, Areej Alhothali, Sunjay Varma and Jesse Hoey Intelligent and Affectively Aligned Evaluation of Online Health Information for Older Adults. AAAI Workshop on Health Intelligence, San Francisco, CA, 2017.
- Sarah Mennicken, Amy Hwang, Rayoung Yang, Jesse Hoey, Alex Mihailidis and Elaine M. Huang Smart for Life: Designing Smart Home Technologies that Evolve with Users. Proceedings of CHI, Seoul, South Korea, 2015
- Aarti Malhotra, Lifei Yu, Tobias Schroeder and Jesse Hoey An exploratory study into the use of an emotionally aware cognitive assistant. Proc. AAAI Workshop on artificial intelligence applied to assistive technologies and smart environments, Austin, TX, 2015
- Tobias Schroeder, Jesse Hoey and Kimberly B. Rogers Modeling Dynamic Identities and Uncertainty in Social Interactions: Bayesian Affect Control Theory. International Conference on Computational Social Science, Helsinki, Finland, 2015
- Amy Hwang, Michael Liu, Jesse Hoey and Alex Mihailidis DIY Smart Home: Narrowing the Gap Between Users and Technology. Proc. of the IUI Workshop on Interactive Machine Learning, Santa Monica, CA, 2013
- Shehroz Khan, Michelle E. Karg, Jesse Hoey and Dana Kulić Towards the detection of unusual temporal events during activities using HMMs. Proceedings of Ubicomp 2012 (Situation, Activity and Goal Awareness Workshop), Pittsburgh, PA, 2012

- Jesse Hoey, Xiao Yang, Marek Grzes, Rene Navarro and Jesus Favela Modeling and Learning for LaCasa, the Location And Context-Aware Safety Assistant. NIPS 2012 Workshop on Machine Learning Approaches to Mobile Context Awareness , Lake Tahoe, NV, 2012
- Marcela Rodriguez, Rene Navarro, Jesus Favela and Jesse Hoey An Ontological Representation Model to Tailor Ambient Assisted Interventions for Wandering. AAAI Fall Symposium on AI for Gerontechnology, Arlington, VA, 2012
- Amy Hwang and Jesse Hoey Smart Home, The Next Generation: Closing the Gap between Users and Technology. AAAI Fall Symposium on AI for Gerontechnology, Washington, DC, 2012
- Hadi Hosseini, *Jesse Hoey* and Robin Cohen. A Market-based Coordination Mechanism for Resource Planning Under Uncertainty. In *AAAI 2012 Student Poster Session* (extended abstract), 2012.
- Jesse Hoey, Xiao Yang, Eduardo Quintana, and Jesus Favela. LaCasa: Location and Context-Aware Safety Assistant. In *Proc. of* 6^{th} *International Conference on Pervasive Computing Technologies for Healthcare* (short paper), San Diego, CA, 2012.
- Jesse Hoey, Xiao Yang and Jesus Favela. Decision theoretic, context aware safety assistance for persons who wander. In 6^{th} *International Workshop on Ubiquitous Health and Wellness (UbiHealth)* at *Pervasive* 2012.
- Veronika Koltunova, Jesse Hoey and Marek Grzes. Goal-oriented sensor selection for intelligent phones: (GOSSIP). *Proceedings of the 2011 international workshop on situation activity and goal awareness*, Beijing, China, 2011
- Dmitry Pyryeskin, Jesse Hoey and Mark Hancock. Extending Interactions into Hoverspace Using Reflected Light. Poster presentation to appear at the *ACM International Conference on Interactive Tabletops and Surfaces* Conference, November 2011.
- Hadi Hosseini, Jesse Hoey and Robin Cohen. Healthcare Resource Scheduling using a Multiagent Markov Decision Process Approach. To appear in *6th INFORMS Workshop on Data Mining and Health Informatics*, November 2011
- Richard Hu, Adel Fakih, Adam Hartfiel, James Tung, Jesse Hoey and Pascal Poupart. 3D Pose Tracking of Walker Users' Lower Limb with a Structured-Light Camera on a Moving Platform. In *Proc. International Workshop on Human Activity Understanding from 3D Data* (HAU3D) Colorado Springs, June, 2011.
- Valerie Leuty, Jesse Hoey, Laurel Young, Jennifer Boger, Alex Mihailidis. Engaging older adults with dementia in creative occupations using technology. Poster presentation at the Canadian Association of Occupational Therapists Conference, Saskatoon, June 2011.
- Jesse Hoey, Thomas Plötz, Dan Jackson, Andrew Monk, Cuong Pham, Patrick Olivier. SNAP: Syndetic Assistance Proceses. *NIPS 2010* Workshop on Machine Learning for Assistive Technologies (MLAT '10), December 2010.
- Robby Goetschalckx, Olana Missura, Jesse Hoey and Thomas Gaertner Games with Dynamic Difficulty Adjustment using POMDPs. *ICML 2010 Workshop on Machine Learning and Games*, Haifa, Israel, June 2010
- Scott Blunsden, Brandi Richards, Dan Jackson, Tom Bartindale, Jen Boger, Alex Mihailidis and Jesse Hoey. Design and Prototype of a Device to Engage Congitively Disabled Older Adults in Visual Artwork. In *Proceedings of the ACM 2nd International Conference on PErvasive Technologies Related to Assistive Environments (PETRA)*, Corfu, Greece, June 2009.
- Patrick Olivier, Andrew Monk, Guangyou Xu and Jesse Hoey. Ambient Kitchen: designing situated services using a high fidelity prototyping environment. In *Proceedings of the ACM 2nd International Conference on PErvasive Technologies Related to Assistive Environments (PETRA)*, Corfu, Greece, June 2009.
- Jesse Hoey, Brandi Richards, Scott Blunsden, Jane Burns, Dan Jackson, Tom Bartindale, Patrick Olivier, Jen Boger and Alex Mihailidis. ePAD: Engaging Platform for Art Development. *IJCAI workshop on Intelligent Systems for Assisted Cognition*, Pasadena, California, 2009.

- Christian Peters, Sven Wachsmuth, and Jesse Hoey. Learning to recognise behaviours of persons with dementia using multiple cues in an HMM-based approach. In *Proceedings of the ACM 2nd International Conference on PErvasive Technologies Related to Assistive Environments (PETRA)*, Corfu, Greece, June 2009.
- Patricia Kan, Jesse Hoey and Alex Mihailidis. Automated upper extremity rehabilitation for stroke patients using a partially observable Markov decision process. *AAAI 2008 Fall Symposium on AI in Eldercare: New Solutions to Old Problems*. Arlington, VA, 2008.
- Axel von Bertoldi, Jennifer N. Boger, Jesse Hoey, Pascal Poupart, Geoff Fernie, Craig Boutilier and Alex Mihailidis Autonomous Guidance Through Handwashing Using A Partially Observable Markov Decision Process. In Alex Mihailidis, Jennifer Boger, Henry Kautz, Lawrence Normie (eds.), Assistive Technology Research Series: *Technology and Aging - Selected Papers from the 2007 International Conference on Technology and Aging*, Volume 21, IOS Press, 2008
- Pooja Viswanathan, Jennifer N. Boger, Jesse Hoey and Alex Mihailidis A Comparison of Stereovision and Infrared as Sensors for an Anti-Collision Powered Wheelchair for Older Adults with Cognitive Impairments. In Alex Mihailidis, Jennifer Boger, Henry Kautz, Lawrence Normie (eds.), Assistive Technology Research Series: *Technology and Aging - Selected Papers from the 2007 International Conference on Technology and Aging*, Volume 21, IOS Press, 2008
- Jasper Snoek, Jesse Hoey and Alex Mihailidis An Automated Tool for Detecting and Preventing Unsafe Stair Use. In Alex Mihailidis, Jennifer Boger, Henry Kautz, Lawrence Normie (eds.), Assistive Technology Research Series: *Technology and Aging - Selected Papers from the 2007 International Conference on Technology and Aging*, Volume 21, IOS Press, 2008
- Jesse Hoey, Daniel Gunn, Alex Mihailidis, and Pantelis Elinas. Obstacle Avoidance Wheelchair System. In *Proc. International Conference on Robotics and Automation* (ICRA) Poster Session, Orlando, FL, May 2006.
- Jesse Hoey, Pascal Poupart, Craig Boutilier and Alex Mihailidis. Semi-Supervised Learning of a POMDP model of Patient-Caregiver Interactions. In *Proc. IJCAI Workshop on Modeling others from Observations* (MOO), Edinburgh, Scotland, July 2005
- Jesse Hoey, Pascal Poupart, Craig Boutilier, and Alex Mihailidis. POMDP models for Assistive Technology. In *Proc. AAAI Fall Symp. on Caring Machines: AI in Eldercare*, Washington DC, Nov. 2005.
- Pantelis Elinas, Enrique Sucar, Alberto Reyes, and Jesse Hoey. A Decision Theoretic Approach for Task Coordination in Social Robots. In *Proc. of Intl. Workshop on Robot and Human Interactive Communication*. Kurashiki, Okayama Japan, September 2004.
- Jesse Hoey. Decision Theoretic Learning of Facial Displays. In NIPS *Workshop on Challenges in Cognitive Vision*, Whistler, BC, December 2003.
- Pantelis Elinas, Jesse Hoey, and James J. Little. HOMER: Human Oriented MEssenger Robot. In Proc. of AAAI *Spring Symposium on Human Interaction with Autonomous Systems in Complex Environments*, Stanford, CA, March 2003.
- Jesse Hoey. Hierarchical unsupervised learning of facial expression categories. In Proc. *Workshop on detection and recognition of events in video*, Vancouver, BC, July 2001.

Theses

- **Jesse Hoey**. *Decision Theoretic Learning of Facial Displays.* Ph.D. Thesis. University of British Columbia, Vancouver, Canada, May 2004
- **Jesse Hoey**. *On the use of an acoustic Doppler current profiler to study zooplankton biomass distributions on the Vancouver Island continental margin.* M.Sc. Thesis. University of British Columbia, Vancouver, Canada, May 1995.

Patents

Automated emergency detection and response, US Patent 12/471/213, granted October 2011.
Alex Mihailidis, **Jesse Hoey**, Jen Boger, David Giesbrecht, John Paul Lobos, Tracy Lee, Vicky Young, Melinda Hamill, Babak Taati, Yani A. Ioannou

METHOD, SYSTEM AND APPARATUS FOR CONFIGURING A CHATBOT. US Patent application 15/103579

Teaching Experience

Guest lecturer, Fachhochschule Potsdam (Potsdam University of Applied Sciences) April-June 2015.
Interflex course "Huch, das System zeigt Emotionen! Ein Forschungsprojekt zum Thema Ambient Assisted Living"

Instructor, School of Computer Science, University of Waterloo 2011-

- 2017 (Winter term): CS886 (Affective Computing)
- 2016 (Winter term): CS886 (Affective Computing)
- 2015 (Fall term): CS486 (Introduction to Artificial Intelligence, 2 sections)
- 2014 (Winter term): CS886 (Affective Computing)
- 2013 (Spring term): CS486 (Introduction to Artificial Intelligence, 2 sections)
- 2013 (Winter term): CS486 (Introduction to Artificial Intelligence)
- 2013 (Winter term): CS793 (Health Informatics II)
- 2012 (Fall tem): CS135 (Desigining Functional Programs)
- 2012 (Winter term): CS793 (Health Informatics II)
- 2012 (Winter term): CS116 (Introduction to Computer Science 2)
- 2011 (Winter term): CS793 (Health Informatics II)
- 2011 (Winter term): CS486 (Introduction to Artificial Intelligence)

Instructor, School of Computing, University of Dundee 2006-2009

- 2009: AC1002 (Information Technology I)
- 2008: AC51022 (Logical and Symbolic Artificial Intelligence)
- 2008: AC51024 (Signals and Images)
- 2008: AC2202 (Information Technology II).
- 2008: AC1002 (Information Technology I)
- 2007: AC51022 (Logical and Symbolic Artificial Intelligence)
- 2007: AC51024 (Signals and Images)
- 2006: AC51022 (Logical and Symbolic Artificial Intelligence)
- 2006: AC51024 (Signals and Images)

Instructor, Department of Computer Science, UBC 2001, 2002

- 2002: CS210 Software Construction (C++)
- 2001: CS210 Software Construction (C++)

Professional Activities

Immediate Past Chair, Technology Professional Interest Area, Alzheimer's Association International Society to Advance Alzheimer's Research and Treatment (ISTAART), **2017-2019**

Program Chair, 10th EAI International Conference on Pervasive Computing Technologies for Healthcare, Cancun, **2016**

Chair, Technology Professional Interest Area, Alzheimer's Association International Society to Advance Alzheimer's Research and Treatment (ISTAART), **2014-2017**

Vice Chair, Technology Professional Interest Area, Alzheimer's Association International Society to Advance Alzheimer's Research and Treatment (ISTAART), **2013-2014**

Programs Chair, Technology Professional Interest Area, Alzheimer's Association International Society to Advance Alzheimer's Research and Treatment (ISTAART), **2011-2013**

Senior Program Committee member, ACM International Joint Conference on Pervasive and Ubiquitous Computing, **2013**

Senior Program Committee member, Alzheimer's Association International Conference (AAIC) **2012**

Senior Program Committee member, International Conference on Pervasive Computing, **2012**

Co-Chair, Workshop on *Machine Learning for Assistive Technology*, Neural Information Processing Systems Conference, Whistler, BC, **2010**

Program Chair, British Machine Vision Conference (BMVC), Dundee, UK, **2011**

Senior Program Committee member, International Joint Conferences on Artificial Intelligence (IJCAI), **2011,2013,2015**

Co-Chair, Medical Image Understanding and Analysis Conference (MIUA), Dundee, UK, **2008**

Organising Committee, AAAI Fall Symposium on AI in Eldercare, Washington, USA, **2008**

Grant Reviewer: American Alzheimer's Association, NSERC, CIHR, NSF, Chief Scientist Office (Scotland).

Reviewer for major computer science journals.

Program committee member and reviewer for major international conferences in computer vision, computer graphics and artificial intelligence.

Currently maintain the SPUDD website and the SPUDD code, providing a fast and free online MDP solver to the research community.

Recent Invited Talks

Keynote Speech at the 4th international Workshop on Sensor-based Activity Recognition and Interaction (iWOAR), Rostock, Germany, September 21, 2017 "Smarter Smart Homes with Social and Emotional Intelligence".

Keynote Speech at the Dartmouth ACT Conference on Modeling Social Interactions: New Directions in Affect Control Theory, Dartmouth College, Hanover, NH, USA, June 22, 2017 "Introduction to Bayesian Affect Control Theory".

Invited Talk Google Waterloo, April 5th, 2017 "Affective Computing in Socio-Technical Systems".

NIH/Smart Environment Research Center (SERC) **Distinguished Speaker** on Health-Assistive Smart Environments, Washington State University, Pullman, WA, Oct. 20th, 2015. "Socio-Emotional Alignment for Cognitive Assistive Technologies".

Keynote speech at the 9th International Conference on Pervasive Computing Technologies for Healthcare Workshop on Adaptive Treatments and Therapies (WATTs), Istanbul, Turkey, May 20, 2015 “Affective Reasoning and Cognitive Assistive Technologies”.

Keynote speech at the 8th International Conference on Ubiquitous Computing & Ambient Intelligence (UCAmI 2014) and the 6th International Work-conference on Ambient Assisted Living (IWAAL 2014), Belfast “General-purpose assistance in health and education”.

Research Seminar, T.U. Delft, Netherlands, Nov. 10th, 2014 “Bayesian affect control theory: a POMDP model of human affective interaction”.

Research Seminar, INRIA, Sophia-Antipolis, France, Sept 5th, 2014 “General-Purpose Cognitive Assistive Technologies”.

Research Seminar, Duke University, Dept. of Sociology, Durham, NC, May 29, 2014, “Affect Control, Affective Computing, and the dawn of the new AI”.

Invited talk, Computer Robot Vision (CRV) Symposium on Assitive Technologies, May 7th, 2014, “General-Purpose Cognitive Assistive Technologies: Progress

Citizenship

Canadian

Languages

Completely fluent in written and spoken English and French.

September, 2017