

# Vadim Bulitko

Associate Professor, AI

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## Academic Interests

### Current

- Cognitive processes and models in humans, animals and computers
- Real-time heuristic search

### Past

- AI for player/user modeling and experience management
- Machine learning in Computer Vision
- Petri Nets for AI
- Recursion Theory

## Education

- 98-00 **Ph.D. in Computer Science**, *University of Illinois at Urbana-Champaign*.
- 96-98 **M.Sc. in Computer Science**, *University of Illinois at Urbana-Champaign*.
- 91-94 **B.Sc. in Mathematics**, *Odessa National University*.

## Experience

- 18-present **Professor**, *Computing Science*, University of Alberta.
- 15 **Visiting Researcher**, *Computational Media*, University of California Santa Cruz.
- 09 **Visiting Associate Professor**, *Computer Science*, University of British Columbia Okanagan.
- 08 **Visiting Researcher**, *Computer Science*, Reykjavik University.
- 08-18 **Associate Professor**, *Computing Science*, University of Alberta.
- 07 **Visiting Researcher**, *Institute for Creative Technologies*, University of Southern California.
- 05 **Visiting Researcher**, *Institut d'Investigació en Intel·ligència Artificial*.
- 05 **Visiting Researcher**, *Computer Science*, University of Southern California.
- 01-08 **Assistant Professor**, *Computing Science*, University of Alberta.
- 00-01 **Research Scientist**, *Forestry Unit*, Alberta Research Council.
- 00 **Sessional Instructor**, *Computing Science*, University of Alberta.
- 00 **Research Associate**, *Computing Science*, University of Alberta.
- 94 **Software Developer**, *Automated Vision Systems, Ltd.*
- 90-91 **Software Developer**, *Alternativa*.

## Student Supervision

### Current Ph.D. students

- 17-on **Sergio Poo Hernandez**

*Recruitment scholarship*

### Current M.Sc. students | Thesis-based

- 18-on **Joshua Sirota**
- 17-on **Everton Schumacker Soares**
- 17-on **Rameel Sethi**

|               |  |  |
|---------------|--|--|
| 17-on         | <b>Devon Sigurdson</b>                                 | <i>British Petroleum</i>                                       |
|               | <b>Graduated Ph.D. students</b>                        |  |
| 07-15         | <b>David Thue</b>                                      | <i>NSERC PGS-D, iCORE</i>                                      |
| 04-12         | <b>Greg Lee</b>  | <i>NSERC PGS-D, iCORE, Ralph Steinhauer</i>                    |
|               | <b>Graduated M.Sc. students   Thesis-based</b>         |  |
| 13-15         | <b>Sergio Poo Hernandez</b>                            |  |
| 14-15         | <b>Yathirajan Brammadesam Manavalan</b>                |  |
| 13-15         | <b>Thórey Maríusdóttir</b>                             |  |
| 11-13         | <b>Alejandro Ramirez</b>                               |  |
| 09-11         | <b>Andrew Cenknier</b>                                 | <i>Queen Elizabeth II</i>                                      |
| 09-11         | <b>Daniel Huntley</b>                                  | <i>NSERC PGS-M, iCORE</i>                                      |
| 06-09         | <b>Stephen Hladky</b>                                  | <i>NSERC PGS-M, iCORE, Queen Elizabeth II</i>                  |
| 05-09         | <b>Jieshan “Shanny” Lu</b>                             |  |
| 05-08         | <b>D. Chris Rayner</b>                                 |  |
| 05-07         | <b>David Thue</b>                                      | <i>NSERC PGS-M, iCORE, FGSR Entrance Bursary, Walter Johns</i> |
| 04-06         | <b>Cosmin Paduraru</b>                                 | <i>iCORE, Alberta Ingenuity</i>                                |
| 01-03         | <b>Lihong Li</b>                                       |  |
| 02-04         | <b>Greg Lee</b>  | <i>NSERC PGS-M</i>   |
| 01-03         | <b>Ilya Levner</b>                                     | <i>NSERC PGS-M</i>   |
|               | <b>Post-doctoral Fellows</b>                           |  |
| 12-15         | <b>Matthew Brown</b>                                   |  |
| 01            | <b>Ying Yuan</b>                                       |  |
|               | <b>Research Project Students   Graduate level</b>      |  |
| 17            | <b>Lovania Goorimoorthee</b>                           |  |
| 15            | <b>Kevin Edey</b>                                      |  |
| 15-17         | <b>Sergio Poo Hernandez</b>                            |  |
| 15-16         | <b>Yathirajan Brammadesam Manavalan</b>                |  |
| 13-14         | <b>Emilie St. Hilaire</b>                              |  |
| 12            | <b>D. Chris Rayner</b>                                 |  |
|               | <b>Research Project Students   Undergraduate level</b> |  |
| 15, 16, 18-on | <b>Alexandrea Czeto</b>                                | <i>NSERC USRA</i>  |
| 18-on         | <b>Kacy Doucet</b>                                     |  |
| 18-on         | <b>Morgan Cselinacz</b>                                |  |
| 18-on         | <b>Robert MacGillivray</b>                             | <i>NSERC USRA</i>  |
| 17            | <b>Isadora Sophia Garcia Rodopoulos</b>                |  |
| 17            | <b>Shelby Carleton</b>                                 |  |
| 17            | <b>Delia Cormier</b>                                   |  |
| 16            | <b>Ronghao “Steve” Yang</b>                            |  |
| 16            | <b>YiJi Zhao</b>                                       |  |
| 16            | <b>Jennifer Yuen</b>                                   | <i>NSERC USRA</i>  |
| 15            | <b>Grace Kinley</b>                                    |  |
| 15            | <b>Christina Ho</b>                                    |  |
| 15, 16        | <b>Alexander Sampley</b>                               | <i>NSERC USRA</i>  |
| 14            | <b>Jaclynn Wong</b>                                    |  |
| 14            | <b>Matthew Fritze</b>                                  |  |
| 14            | <b>Renato Ribeiro</b>                                  | <i>CAPES</i>   |

|        |                              |                 |
|--------|------------------------------|-----------------|
| 14     | Igor Antônio Pereira Machado | CNPq            |
| 14     | Alex Gonçalves               | CNPq            |
| 13-14  | Sarah Beck                   |                 |
| 12     | Shane Riczu                  |                 |
| 11     | Stephen Jahns                | NSERC USRA      |
| 10     | Trevon Romanuik              |                 |
| 08, 09 | Mike Webb                    | NSERC USRA (×2) |
| 07     | Trevor Bekolay               | NSERC USRA      |
| 07     | Freeman Fan                  |                 |
| 06     | Timothy Yau                  | NSERC USRA      |
| 06     | Eric Wasylishen              | NSERC USRA      |
| 06     | Tian Tian                    |                 |
| 05-06  | Mitja Luštrek                |                 |
| 05     | Burc Gunes                   |                 |
| 04     | Scott Thiessen               |                 |
| 04     | Lawrence Chan                |                 |
| 03     | Jesse Reid                   |                 |
| 03     | Dorothy Lau                  |                 |
| 01, 02 | Guanwen Zhang                |                 |

### Research Project Students | High-school interns

|       |                       |        |
|-------|-----------------------|--------|
| 18-on | Grace Leung           | FSST   |
| 14    | Allyson Shewchuk      | WISEST |
| 14    | Ramnik Sekhon         | HIP    |
| 14    | Frederic Sauve-Hoover | HIP    |
| 14    | Seth Traverse         | HIP    |
| 14    | Leoza Kabir           | HIP    |
| 14    | Luke Slevinsky        | HIP    |
| 14    | Jesse Underwood       | HIP    |
| 07    | Phillip Silver        | HIP    |
| 03    | Jane Hilderman        | WISEST |

## Additional Student Responsibilities

### Master and Ph.D. Final Examinations

|    |                   |   |
|----|-------------------|---|
| 17 | Nicolas Barriga   | <i>Ph.D., Computing Science, University of Alberta</i>  |
| 16 | Sankalp Prabhakar | <i>M.Sc., Computing Science, University of Alberta</i>  |
| 16 | Dave Churchill    | <i>Ph.D., Computing Science, University of Alberta</i>  |
| 15 | Fan Xie           | <i>Ph.D., Computing Science, University of Alberta</i>  |
| 15 | Andrew Israelsen  | <i>Master, Music, University of Alberta</i>             |
| 15 | Neesha Desai      | <i>Ph.D., Computing Science, University of Alberta</i>  |
| 14 | Sriram Srinivasan | <i>Master, Computing Science, University of Alberta</i> |
| 14 | Rick Valenzano    | <i>Ph.D., Computing Science, University of Alberta</i>  |
| 14 | Reza Sebti        | <i>Master, Philosophy, University of Alberta</i>        |
| 14 | Zhaoxing Bu       | <i>Master, Computing Science, University of Alberta</i> |
| 13 | Nika Pona         | <i>Master, Philosophy, University of Alberta</i>        |
| 13 | Marc Bellemare    | <i>Ph.D., Computing Science, University of Alberta</i>  |
| 12 | Bo Pang           | <i>Master, Computing Science, University of Alberta</i> |

|    |                             |   |
|----|-----------------------------|---|
| 12 | <b>Jing Zhang</b>           | <i>Master, Computing Science, University of Alberta</i> |
| 12 | <b>Mohammad Ajallooeian</b> | <i>Master, Computing Science, University of Alberta</i> |
| 12 | <b>Michael Parnes</b>       | <i>Master, Psychology, University of Alberta</i>        |
| 11 | <b>Jason Taylor</b>         | <i>Ph.D., Philosophy, University of Alberta</i>         |
| 11 | <b>Aditya Bhargava</b>      | <i>Master, Computing Science, University of Alberta</i> |
| 10 | <b>Brian Duffels</b>        | <i>Master, Psychology, University of Alberta</i>        |
| 10 | <b>Yavar Nadaf</b>          | <i>Master, Computing Science, University of Alberta</i> |
| 09 | <b>Christopher Kerr</b>     | <i>Master, Computing Science, University of Alberta</i> |
| 09 | <b>Richard Zhao</b>         | <i>Master, Computing Science, University of Alberta</i> |
| 06 | <b>Sverrir Sigmondarson</b> | <i>Master, Computer Science, Reykjavik University</i>   |
| 05 | <b>Patrick McGivern</b>     | <i>Ph.D., Philosophy, University of Alberta</i>         |

### Ph.D. Candidacy Examinations

|    |                        |  |
|----|------------------------|--|
| 17 | <b>Erik deJong</b>     | <i>Educational Psychology, University of Alberta</i> |
| 15 | <b>Nicolas Barriga</b> | <i>Computing Science, University of Alberta</i>      |
| 14 | <b>Ruojing Zhou</b>    | <i>Psychology, University of Alberta</i>             |
| 14 | <b>Dave Churchill</b>  | <i>Computing Science, University of Alberta</i>      |
| 13 | <b>Nolan Bard</b>      | <i>Computing Science, University of Alberta</i>      |
| 13 | <b>Fan Xie</b>         | <i>Computing Science, University of Alberta</i>      |
| 12 | <b>Rick Valenzano</b>  | <i>Computing Science, University of Alberta</i>      |
| 12 | <b>Levi Lelis</b>      | <i>Computing Science, University of Alberta</i>      |
| 11 | <b>D. Chris Rayner</b> | <i>Computing Science, University of Alberta</i>      |
| 10 | <b>Eric Legge</b>      | <i>Psychology, University of Alberta</i>             |

### Supervisory Committee Service

|       |                        |   |
|-------|------------------------|---|
| 15-17 | <b>Nicolas Barriga</b> | <i>Computing Science, University of Alberta</i> |
| 13-15 | <b>Fan Xie</b>         | <i>Computing Science, University of Alberta</i> |
| 12-14 | <b>Rick Valenzano</b>  | <i>Computing Science, University of Alberta</i> |
| 12-16 | <b>Dave Churchill</b>  | <i>Computing Science, University of Alberta</i> |
| 11-15 | <b>Neesha Desai</b>    | <i>Computing Science, University of Alberta</i> |

### Mentorship

|    |                                      |   |
|----|--------------------------------------|---|
| 16 | <b>Kris De Asis</b>                  | <i>Computing Science, University of Alberta</i> |
| 16 | <b>Fushan Li</b>                     | <i>Computing Science, University of Alberta</i> |
| 16 | <b>Chen Ma</b>                       | <i>Computing Science, University of Alberta</i> |
| 16 | <b>Chi Zhang</b>                     | <i>Computing Science, University of Alberta</i> |
| 16 | <b>Chang Liu</b>                     | <i>Computing Science, University of Alberta</i> |
| 16 | <b>Erick Eduardo Ochoa Lopez</b>     | <i>Computing Science, University of Alberta</i> |
| 16 | <b>Shrimanti Ghosh</b>               | <i>Computing Science, University of Alberta</i> |
| 16 | <b>Salwa Abougamila</b>              | <i>Computing Science, University of Alberta</i> |
| 16 | <b>Tanvir Sajed</b>                  | <i>Computing Science, University of Alberta</i> |
| 16 | <b>Martin Ichilevici de Oliveira</b> | <i>Computing Science, University of Alberta</i> |
| 12 | <b>Hendrik Baier</b>                 | <i>Computer Science, Maastricht University</i>  |

## Courses Taught

### Graduate

|           |   |            |
|-----------|---|------------|
| CMPUT 605 | <b>Deep Learning with Applications to Sound Analysis and Behavior Detection</b> | <i>F17</i> |
| CMPUT 605 | <b>Robust Real-time Heuristic Search</b>  | <i>W17</i> |
| CMPUT 701 | <b>A-Life for Real-time Heuristic Search</b>                                    | <i>W17</i> |

|           |  |  |
|-----------|--|--|
| CMPUT 651 | <b>Real-time Heuristic Search</b>                                      | F16  |
| CMPUT 605 | <b>Artificial Intelligence for Interactive Storytelling</b>            | F12  |
| CMPUT 651 | <b>Topics in AI with Applications to Video Games</b>                   | F09, F11, F13  |
| CMPUT 651 | <b>Decision Making in AI: From Foundations to the State of the Art</b> | F04, F05, F06  |
| CMPUT 650 | <b>Topics in AI: Learning To Make Decisions</b>                        | F01, F02   |
| CMPUT 605 | <b>Individual Studies in Quantum Computing</b>                         | W02  |
|           | <b>Undergraduate</b>   |  |
| CMPUT 400 | <b>Industrial Internship Practicum</b>                                 | F14, W15   |
| CMPUT 250 | <b>Computers and Games</b>   | F09, W10, F10, W11, F11, W12, F12, W13, F13, W14, F14, W15, F16, W17, F17, W18 |
| COSC 419D | <b>Computers and Games</b>   | W09  |
| CMPUT 272 | <b>Formal Systems and Logic in Computing Science</b>                   | W02, W03, W04  |
| CMPUT 115 | <b>Programming With Data Structures</b>                                | F05, W06, W07, W08   |
| CMPUT 114 | <b>Introduction to Computing Science</b>                               | F03, F04, F07, W11   |
| CMPUT 101 | <b>Introduction to Computing</b>                                       | F00, W13   |

## Publications

### Journal papers (refereed)

- 2016 Nathan Sturtevant and Vadim Bulitko. *Scrubbing During Learning In Real-time Heuristic Search*. Journal of Artificial Intelligence Research (JAIR), 57:307-343. AAAI Press.
- 2015 Danielle M. Baron and Alejandro J. Ramirez and Vadim Bulitko and Christopher R. Madan and Ariel Greiner and Peter L. Hurd and Marcia L. Spetch. *Practice Makes Proficient: Pigeons (Columba livia) Learn Efficient Routes on Full-circuit Navigational Traveling Salesperson Problems*. Animal Cognition. 18:53-64.
- 2014 Alejandro Ramirez and Vadim Bulitko. *Automated Planning and Player Modelling for Interactive Storytelling*. IEEE Transactions on Computational Intelligence and AI in Games. PP(99). Pages 12. doi: 10.1109/TCI-AIG.2014.2346690.
- 2013 Andrew Cenker and Vadim Bulitko and Marcia Spetch and Eric Legge and Craig Anderson and Matthew Brown. *Passing a Hide and Seek Third-Person Turing Test*. IEEE Transactions on Computational Intelligence and AI in Games. PP(99). Pages 13. doi: 10.1109/TCIAIG.2013.2275162.
- 2013 Greg Lee and Vadim Bulitko and Elliot Ludvig. *Automated Story Selection for Color Commentary in Sports*. IEEE Transactions on Computational Intelligence and AI in Games. PP(99). Pages 12. doi: 10.1109/TCI-AIG.2013.2275199.
- 2012 Vadim Bulitko and Matthew Brown. *Flow Maximization as a Guide to Optimizing Performance: A Computational Model*. Advances in Cognitive Systems, 2:239-256. Cognitive Systems Foundation.
- 2012 Ramon Lawrence and Vadim Bulitko. *Database-Driven Real-time Heuristic Search in Video-game Pathfinding*. IEEE Transactions on Computational Intelligence and AI in Games. PP(99). Pages 30. doi: 10.1109/TCI-AIG.2012.2230632.
- 2012 Eric L.G. Legge and Marcia L. Spetch and Andrew Cenker and Vadim Bulitko and Craig Anderson and Matthew Brown and Donald Heth. *Not All Locations Are Created Equal: Exploring How Adults Hide and Search for Objects*. PLoS ONE 7(5): e36993. doi:10.1371/journal.pone.0036993.
- 2010 Vadim Bulitko and Yngvi Björnsson and Ramon Lawrence. *Case-Based Subgoaling in Real-Time Heuristic Search for Video Game Pathfinding*. Journal of Artificial Intelligence Research (JAIR), 39: 269-300. AAAI Press.
- 2009 Katherine J. Talbot and Eric L.G. Legge and Vadim Bulitko and Marcia L. Spetch. *Hiding and Searching Strategies of Adult Humans in a Virtual and a Real-Space Room*. Learning and Motivation. Volume 40, issue 2 (May), pages 221-233. Elsevier.
- 2008 Vadim Bulitko and Mitja Luštrek and Jonathan Schaeffer and Yngvi Björnsson and Sverrir Sigmundarson. *Dynamic Control in Real-Time Heuristic Search*. Journal of Artificial Intelligence Research (JAIR), 32: 419-452. AAAI Press.

- 2007 Vadim Bulitko and Nathan Sturtevant and Jieshan Lu and Timothy Yau. *Graph Abstraction in Real-time Heuristic Search*. Journal of Artificial Intelligence Research (JAIR), 30:51-100.
- 2007 Greg Lee and Vadim Bulitko and Ilya Levner. *HSM: Heuristic Search with Meta-Models for Image Interpretation*. Journal of Multiple-Valued Logic and Soft Computing, 14(1-2):129-144.
- 2007 Lihong Li and Vadim Bulitko and Russell Greiner. *Focus of Attention in Reinforcement Learning*. Journal of Universal Computer Science (J.UCS), 13(9):1246-1269.
- 2006 Vadim Bulitko and Greg Lee. *Learning in Real Time Search: A Unifying Framework*. Journal of Artificial Intelligence Research (JAIR), 25:119-157.
- 2006 Vadim Bulitko and David C. Wilkins. *ML-TIPN: An Algorithm for Automated Acquisition of Domain Models based on Time Interval Petri Nets*. Journal of Multiple-Valued Logic and Soft Computing, pages 17, 12:391-407.
- 2006 Valeriy K. Bulitko and Burton Voorhees and Vadim Bulitko. *Discrete Baker Transformations for Linear Cellular Automata Analysis*. Journal of Cellular Automata, 1(1):41-70.
- 2003 Vadim Bulitko and David C. Wilkins. *Qualitative Simulation of Temporal Concurrent Processes Using Time Interval Petri Nets*. Artificial Intelligence (AIJ), 144(1-2):95-124.
- 2003 Valeriy K. Bulitko and Vadim Bulitko. *On Existence of Complete Sets for Bounded Reducibilities*. Mathematical Logic Quarterly, 6(49):567-575.
- 1998 Valeriy K. Bulitko and Vadim Bulitko. *On A Criterion For NP-completeness*. Ukrainian Mathematical Journal, 50(12):1686-1691.
- 1995 Vadim Bulitko. *On Completeness of Pseudosimple Sets*. Journal of Universal Computer Science (J.UCS), 1(2):151-154.

### Conference papers (fully refereed; acceptance rate %)

- 2017 Devon Sigurdson and Vadim Bulitko. *Deep Learning for Real-time Heuristic Search Algorithm Selection*. Proceedings of the AAAI Conference on Artificial Intelligence and Interactive Digital Entertainment (AIIDE), in press. [ $19/76 = 25\%$ ]
- 2017 Mina Abdi Oskouie and Vadim Bulitko. *Robustness of Real-time Heuristic Search Algorithms to Read/Write Error in Externally Stored Heuristics*. Proceedings of the AAAI Conference on Artificial Intelligence and Interactive Digital Entertainment (AIIDE), in press. [ $38/76 = 50\%$ ]
- 2017 Carlos Hernandez Ulloa and Adi Botea and Jorge Baier and Vadim Bulitko. *Online Bridged Pruning for Real-Time Search with Arbitrary Lookaheads*. Proceedings of the International Joint Conference on Artificial Intelligence (IJCAI), (in press). [ $660/2540 = 26\%$ ]
- 2016 Vadim Bulitko. *Per-map Algorithm Selection in Real-time Heuristic Search*. Proceedings of the AAAI Conference on Artificial Intelligence and Interactive Digital Entertainment (AIIDE), pages 143-148. [ $35/63 = 56\%$ ]
- 2016 Vadim Bulitko. *Searching for Real-time Search Algorithms*. In Proceedings of the Annual Symposium on Combinatorial Search (SoCS), pages 121-122. [ $22/34 = 65\%$ ]
- 2016 Vadim Bulitko and Alexander Sampley. *Weighted Lateral Learning in Real-time Heuristic Search*. In Proceedings of the Annual Symposium on Combinatorial Search (SoCS), pages 10-18. [ $13/34 = 38\%$ ]
- 2016 Vadim Bulitko. *Evolving Real-time Heuristic Search Algorithms*. In Proceedings of the Fifteenth International Conference on the Synthesis and Simulation of Living Systems (ALIFEXV), pages 108-115.
- 2015 Thórey Maríusdóttir and Vadim Bulitko and Matthew Brown. *Maximizing Flow as a Metacontrol in Angband*. In Proceedings of the Eleventh AAAI Conference on Artificial Intelligence and Interactive Digital Entertainment (AIIDE), pages 149-155. [ $31/53 = 59\%$ ]
- 2015 Yathirajan Brammadesam Manavalan and Vadim Bulitko and Marcia Spetch. *A Lightweight Algorithm for Procedural Generation of Emotionally Affected Behavior and Appearance*. In Proceedings of the Eleventh AAAI Conference on Artificial Intelligence and Interactive Digital Entertainment (AIIDE), pages 142-148. [ $31/53 = 59\%$ ]
- 2015 Sergio Poo Hernandez and Vadim Bulitko and Marcia Spetch. *Keeping the Player on an Emotional Trajectory in Interactive Storytelling*. In Proceedings of the Eleventh AAAI Conference on Artificial Intelligence and Interactive Digital Entertainment (AIIDE), pages 65-71. [ $15/53 = 28\%$ ]
- 2015 Vadim Bulitko and David Thue. *A Call for Flow Modeling in Interactive Storytelling*. In Proceedings of The Third Annual Conference on Advances in Cognitive Systems (ACS), pages 10. [ $32/36 = 89\%$ ]

- 2014 Yathirajan Brammadesam Manavalan and Vadim Bulitko. *Appraisal of Emotions from Resources*. In Proceedings of The Seventh International Conference on Interactive Digital Storytelling (ICIDS), LNCS 8832, pages 224-227. [ $^{29}/_{62} = 47\%$ ]
- 2014 Sergio Poo Hernandez and Vadim Bulitko and Emilie St.Hilaire. *Emotion-based Interactive Storytelling with Artificial Intelligence*. In Proceedings of the Tenth AAAI Conference on Artificial Intelligence and Interactive Digital Entertainment (AIIDE), pages 146-152. [ $^{30}/_{53} = 57\%$ ]
- 2014 Nathan Sturtevant and Vadim Bulitko. *Reaching the Goal in Real-Time Heuristic Search: Scrubbing Behavior is Unavoidable*. In Proceedings of the Seventh Annual Symposium on Combinatorial Search (SoCS), pages 166-174. [ $^{22}/_{32} = 69\%$ ]
- 2013 Alejandro Ramirez and Vadim Bulitko and Marcia Spetch. *Evaluating Planning-Based Experience Managers for Agency and Fun in Text-based Interactive Narrative*. In Proceedings of the Ninth AAAI Conference on Artificial Intelligence and Interactive Digital Entertainment (AIIDE), pages 65-71. Boston, Massachusetts, October 2013. [ $^{15}/_{55} = 27\%$ ]
- 2012 Greg Lee and Vadim Bulitko and Elliot Ludvig. *Sports Commentary Recommendation System (SCoReS): Machine Learning for Automated Narrative*. In Proceedings of the Eighth AAAI Conference on Artificial Intelligence and Interactive Digital Entertainment (AIIDE), pages 32-37. Stanford, California, October 2012. [ $^{16}/_{59} = 27\%$ ]
- 2012 Alejandro Ramirez Sanabria and Vadim Bulitko. *Telling Interactive Player-specific Stories and Planning for it : ASD + PaSSAGE = PAST*. In Proceedings of the Eighth AAAI Conference on Artificial Intelligence and Interactive Digital Entertainment (AIIDE), pages 173-178. Stanford, California, October 2012. [ $^{32}/_{59} = 54\%$ ]
- 2012 Vadim Bulitko and Chris Rayner and Ramon Lawrence. *On Casebase Formation in Real-time Heuristic Search*. In Proceedings of the Eighth AAAI Conference on Artificial Intelligence and Interactive Digital Entertainment (AIIDE), pages 106-111. Stanford, California, October 2012. [ $^{32}/_{59} = 54\%$ ]
- 2011 David Thue and Vadim Bulitko and Marcia Spetch and Trevon Romaniuk. *A Computational Model of Perceived Agency in Video Games*. In Proceedings of the Seventh AAAI Conference on Artificial Intelligence and Interactive Digital Entertainment (AIIDE), pages 91-96. Stanford, California, October 2011. [ $^{17}/_{48} = 35\%$ ]
- 2011 Andrew Cenkner and Vadim Bulitko and Marcia Spetch. *A Generative Computational Model for Human Hide and Seek Behavior*. In Proceedings of the Seventh AAAI Conference on Artificial Intelligence and Interactive Digital Entertainment (AIIDE), pages 128-133. Stanford, California, October 2011. [ $^{34}/_{48} = 70\%$ ]
- 2011 Nathan Sturtevant and Vadim Bulitko. *Learning where you are going and from whence you came: h- and g-cost learning in real-time heuristic search*. In Proceedings of the 22nd International Joint Conference on Artificial Intelligence (IJCAI), pages 365-370. Barcelona, Spain, July 2011. [ $^{400}/_{1325} = 30\%$ ]
- 2010 Ramon Lawrence and Vadim Bulitko. *Taking Learning out of Real-time Heuristic Search for Video-game Pathfinding*. In Proceedings of the Twenty-Third Australasian Joint Conference on Artificial Intelligence. Adelaide, Australia, December 2010. Pages 405-414. [ $^{53}/_{112} = 47\%$ ]
- 2010 David Thue and Vadim Bulitko and Marcia Spetch and Trevon Romanuik. *Player Agency and the Relevance of Decisions*. In Proceedings of the Third International Conference on Interactive Digital Storytelling (ICIDS). Edinburgh, UK. November 2010. Pages 210-215. [ $^{25}/_{54} = 46\%$ ]
- 2010 Greg Lee and Vadim Bulitko. *Automated Storytelling in Sports: A Rich Domain to be Explored*. In Proceedings of the Third International Conference on Interactive Digital Storytelling (ICIDS). Edinburgh, UK. November 2010. Pages 252-255. [ $^{25}/_{54} = 46\%$ ]
- 2010 David Thue and Vadim Bulitko and Marcia Spetch and Michael Webb. *Socially Consistent Characters in Player-Specific Stories*. In Proceedings of the Artificial Intelligence and Interactive Digital Entertainment conference (AIIDE). Pages 198-203. [ $^{35}/_{57} = 61\%$ ]
- 2010 Nathan Sturtevant and Vadim Bulitko and Yngvi Björnsson. *On Learning In Agent-Centered Search*. Proceedings of the 9th International Conference on Autonomous Agents and Multiagent Systems (AAMAS), Toronto, Canada. Pages 333-340. [ $^{163}/_{685} = 24\%$ ]
- 2009 David Thue and Vadim Bulitko and Marcia Spetch and Michael Webb. *Exaggerated Claims for Interactive Stories*. In Proceedings of the International Conference on Interactive Digital Storytelling (ICIDS). Guimarães, Portugal. Pages 179-184. [ $^{28}/_{89} = 33\%$ ]

- 2009 Vadim Bulitko and Yngvi Björnsson. *kNN LRTA\*: Simple Subgoaling for Real-time Search*. In Proceedings of the Artificial Intelligence and Interactive Digital Entertainment conference (AIIDE). Stanford, California. 2-7. [44%]
- 2009 Yngvi Björnsson and Vadim Bulitko and Nathan Sturtevant. *TBA\*: Time-Bounded A\**. In Proceedings of the International Joint Conference on Artificial Intelligence (IJCAI). Pasadena, California. 431-436. [26%]
- 2008 Stephen Hladky and Vadim Bulitko. *An Evaluation of Models for Predicting Opponent Positions in First-Person Shooter Video Games*. In Proceedings of IEEE Symposium on Computational Intelligence and Games (CIG), pages 39-46. Perth, Australia. [50%]
- 2008 David Thue and Vadim Bulitko and Marcia Spetch. *Making Stories Player-Specific: Delayed Authoring in Interactive Storytelling*. In Proceedings of the First Joint International Conference on Interactive Digital Storytelling (ICIDS), pages 230-241. Erfurt, Germany. [30%]
- 2008 Alejandro Isaza and Jieshan Lu and Vadim Bulitko and Russell Greiner. *A Cover-Based Approach to Multi-Agent Moving Target Pursuit*. In Proceedings of the Artificial Intelligence and Interactive Digital Entertainment conference (AIIDE), pages 54-59. Stanford, California. [40%]
- 2008 Vadim Bulitko and Steven Solomon and Jonathan Gratch and Michael van Lent. *Modeling Culturally and Emotionally Affected Behavior*. In Proceedings of the Artificial Intelligence and Interactive Digital Entertainment conference (AIIDE), pages 10-15. Stanford, California. [40%]
- 2008 Alejandro Isaza and Csaba Szepesvári and Vadim Bulitko and Russell Greiner. *Speeding Up Planning in Markov Decision Processes via Automatically Constructed Abstractions*. In Proceedings of the 24th Conference on Uncertainty in Artificial Intelligence (UAI), pages 306-314, Helsinki, Finland. [28%]
- 2007 Vadim Bulitko and Yngvi Björnsson and Mitja Luštrek and Jonathan Schaeffer and Sverrir Sigmundarson. *Dynamic Control in Path-Planning with Real-Time Heuristic Search*. In Proceedings of the International Conference on Automated Planning and Scheduling (ICAPS), pages 49-56, Providence, Rhode Island. [32%]
- 2007 David Thue and Vadim Bulitko and Marcia Spetch and Eric Wasylishen. *Interactive Storytelling: A Player Modelling Approach*. In Proceedings of the Artificial Intelligence and Interactive Digital Entertainment conference (AIIDE), pages 43-48, Stanford, California. [38%]
- 2007 Brian Tanner and Vadim Bulitko and Anna Koop and Cosmin Paduraru. *Grounding Abstractions in Predictive State Representations*. In Proceedings of the International Joint Conference on Artificial Intelligence (IJCAI), pages 1077-1082, Hyderabad, India. [35%]
- 2007 D. Chris Rayner and Katherine Davison and Vadim Bulitko and Kenneth Anderson and Jieshan Lu. *Real-Time Heuristic Search with a Priority Queue*. In Proceedings of the International Joint Conference on Artificial Intelligence (IJCAI), pages 2372-2377, Hyderabad, India. [35%]
- 2006 David Thue and Vadim Bulitko. *Modelling Goal-directed Players in Digital Games*. In Proceedings of the Artificial Intelligence and Interactive Digital Entertainment conference (AIIDE), pages 86-91, Marina del Rey, California. [41%]
- 2006 Greg Lee and Vadim Bulitko. *Genetic Algorithms for Action Set Selection Across Domains: A Demonstration*. In Proceedings of the Genetic and Evolutionary Computation Conference (GECCO), pages 1697-1704, Seattle, Washington. [46%]
- 2005 Vadim Bulitko and Nathan Sturtevant and Maryia Kazakevich. *Speeding Up Learning in Real-time Search via Automatic State Abstraction*. In Proceedings of the National Conference on Artificial Intelligence (AAAI), pages 1349-1354. Pittsburgh, Pennsylvania. [18%]
- 2005 Greg Lee and Vadim Bulitko. *GAMM: Genetic Algorithms with Meta-Models for Vision*. In Proceedings of the Genetic and Evolutionary Computation Conference (GECCO), pages 2029-2036. Washington, DC. [50%]
- 2005 Vadim Bulitko and David C. Wilkins. *Machine Learning for Time Interval Petri Nets*. Lecture Notes in Artificial Intelligence (LNAI), Proceedings of the 18th Australian Joint Conference on Artificial Intelligence, pages 959-965. Springer-Verlag, Sydney, Australia. [32%]
- 2004 Ilya Levner and Vadim Bulitko. *Machine Learning for Adaptive Image Interpretation*. In Proceedings of the Innovative Applications of Artificial Intelligence Conference (IAAI), pages 870-876. San Jose, California. [37%]



- 2003 Ilya Levner and Vadim Bulitko and Lihong Li and Greg Lee and Russell Greiner. *Towards Automated Creation of Image Interpretation Systems*. In Proceedings of the 16th Australian Joint Conference on Artificial Intelligence, pages 653-665. Perth, Australia. [45%]
- 2003 Vadim Bulitko and Lihong Li and Russell Greiner and Ilya Levner. *Lookahead Pathologies for Single Agent Search*. In Proceedings of the International Joint Conference on Artificial Intelligence (IJCAI), pages 1531-1533. Acapulco, Mexico. [28%]
- 2002 Ilya Levner and Vadim Bulitko and Omid Madani and Russell Greiner. *Performance of Lookahead Control Policies in the face of Abstractions and Approximations*. Lecture Notes in Artificial Intelligence (LNAI), Proceedings of the 5th International Symposium on Abstraction, Reformulation and Approximation (SARA), pages 299-308. Springer-Verlag, Berlin, Heidelberg.
- 1999 Vadim Bulitko and David C. Wilkins. *Automated Instructor Assistant for Ship Damage Control*. In Proceedings of the Innovative Applications of Artificial Intelligence Conference (IAAI), pages 778-785. Orlando, Florida. [~ 35%]

### Book chapters

- 2017 Sergio Poo Hernandez and Vadim Bulitko. *Artificial Intelligence for Managing an Emotion-Based Interactive Ballet Video Game*. In N. Stovel (Ed.) *The Creation of iGiselle: Classical Ballet Meets Contemporary Video Games*. University of Alberta Press. (in press).
- 2015 Vadim Bulitko and Greg Lee and Sergio Poo Hernandez and Alejandro Ramirez and David Thue. *Techniques for AI-driven Experience Management in Interactive Narratives*. In S. Rabin (Ed.) *Game AI Pro. Volume II*, pages 523 - 533.
- 2011 Vadim Bulitko and Yngvi Björnsson and Nathan Sturtevant and Ramon Lawrence. *Real-time Heuristic Search for Game Pathfinding*. In book: *Applied Research in Artificial Intelligence for Computer Games*. Springer USA. Pages 1-30.
- 2011 Mark Riedl and David Thue and Vadim Bulitko. *Game AI as Storytelling*. In book: *Applied Research in Artificial Intelligence for Computer Games*. Springer USA. Pages 125-150.
- 2008 David Thue and Vadim Bulitko and Marcia Spetch. *Player Modelling for Interactive Storytelling: A Practical Approach*. In S. Rabin (Ed.) *AI Game Programming Wisdom*, Charles River Media, Inc.: volume 4, pages 633-646.
- 2006 Ilya Levner and Vadim Bulitko and Guohui Lin. *Feature Extraction for Classification of Proteomic Mass Spectra: A Comparative Study*. In I. Guyon, S. Gunn, M. Nikravesh and L. Zadeh (Eds.) *Feature Extraction, Foundations and Applications: Series Studies in Fuzziness and Soft Computing*, Springer Berlin / Heidelberg, Volume 207, pages 607-624.

### Magazine articles

- 2013 Mark Riedl and Vadim Bulitko. *Interactive Narrative: An Intelligent Systems Approach*. *Artificial Intelligence magazine*. Volume 34, number 1. pages 67-77.
- 2012 Vadim Bulitko and Mark Riedl and Arnav Jhala and Michael Buro and Nathan Sturtevant. *Recap of the 2011 AI and Interactive Digital Entertainment Conference*. *Artificial Intelligence magazine*. Volume 33, Number 1, pages 51-54.
- 2011 G. Michael Youngblood and Vadim Bulitko and Ben Weber. *Recap of the 2010 AI and Interactive Digital Entertainment Conference*. *Artificial Intelligence magazine*. Volume 32, Number 2, pages 131-132.
- 2010 Vadim Bulitko and J. Christopher Beck. *SARA 2009: The Eighth Symposium on Abstraction, Reformulation and Approximation*. *Artificial Intelligence magazine*. Volume 31, Number 2, pages 95-96.
- 2008 Jonathan Schaeffer and Vadim Bulitko and Michael Buro. *Bots Get Smart*. *IEEE Spectrum magazine*. December, 44-49.
- 1992 Vadim Bulitko. *Pseudoparallel Program Execution on BK-0010*. *INFO*, volume 2.

### Conference/workshop/symposium papers (lightly refereed or not refereed)

- 2017 Vadim Bulitko. *Effects of Self-knowledge: Once Bitten Twice Shy*. Proceedings of the Experimental AI in Games (EXAG) Workshop at the AAAI Conference on Artificial Intelligence and Interactive Digital Entertainment (AIIDE). pages 7.

- 2017 Vadim Bulitko and Shelby Carleton and Delia Cormier and Devon Sigurdson and John Simpson. *Towards Positively Surprising Non-Player Characters in Video Games*. Proceedings of the Experimental AI in Games (EXAG) Workshop at the AAAI Conference on Artificial Intelligence and Interactive Digital Entertainment (AIIDE). pages 7.
- 2017 Astrid Ensslin and Tejasvi Goormoorthee and Shelby Carleton and Vadim Bulitko and Sergio Poo Hernandez. *Deep Learning for Speech Accent Detection in Videogames*. Proceedings of the Experimental AI in Games (EXAG) Workshop at the AAAI Conference on Artificial Intelligence and Interactive Digital Entertainment (AIIDE). pages 4.
- 2014 Vadim Bulitko. *Flow for Meta Control*. Special Session on Artificial General Intelligence and Cognitive Science. The Seventh Conference on Artificial General Intelligence. 10 pages. Published on-line.
- 2014 Sarah Beck and Vadim Bulitko and Sergio Poo Hernandez and Emilie St.Hilaire and Nora Stovel and Laura Sydora. *Women with Wings: The Romantic Ballerina Then and Now*. Abstract in Proceedings of Grace Hopper Conference. Phoenix, Arizona.
- 2013 David Thue and Vadim Bulitko and Howard Hamilton. *Implementation Cost and Efficiency for AI Experience Managers*. In Proceedings of the Intelligent Narrative Technologies (INT) workshop of the AAAI Conference on Artificial Intelligence and Interactive Digital Entertainment (AIIDE). Boston, MA. October. Pages 4.
- 2013 Sergio Poo Hernandez and Vadim Bulitko. *A Call for Emotion Modeling in Interactive Storytelling*. In Proceedings of the Intelligent Narrative Technologies (INT) workshop of the AAAI Conference on Artificial Intelligence and Interactive Digital Entertainment (AIIDE). Boston, MA. October. Pages 4.
- 2012 David Thue and Vadim Bulitko. *Procedural Game Adaptation: Framing Experience Management as Changing an MDP*. In Proceedings of the Intelligent Narrative Technologies (INT) workshop of the AAAI Conference on Artificial Intelligence and Interactive Digital Entertainment (AIIDE). Stanford, CA. October. Pages 6.
- 2011 Daniel Huntley and Vadim Bulitko. *Extending the Applications of Recent Real-time Heuristic Search*. In Proceedings of the National Conference on Artificial Intelligence (AAAI), Student Abstract and Poster track. San Francisco, California. Pages 1792-1793.
- 2008 Vadim Bulitko and Steven Solomon and Jonathan Gratch and Michael van Lent. *Modeling Culturally and Emotionally Affected Behavior*. In Proceedings of the Tenth International Conference on the Simulation of Adaptive Behavior (SAB), Workshop on the role of emotion in adaptive behavior and cognitive robotics. Osaka, Japan. This is a shortened version of an AIIDE'08 publication by the same authors. Pages 10.
- 2008 David Thue and Vadim Bulitko and Marcia Spetch. *Simulating the Adaptive Behaviour of Storytellers in Computer Video Games*. In Proceedings of the Tenth International Conference on the Simulation of Adaptive Behavior (SAB), Last Minute Results track. Osaka, Japan. Pages 2.
- 2008 Mitja Luštrek and Vadim Bulitko. *Thinking Too Much: Pathology in Pathfinding*. In Proceedings of the 18th European Conference on Artificial Intelligence (ECAI), pages 899-900. Patras, Greece.
- 2008 David Thue and Vadim Bulitko and Marcia Spetch. *PaSSAGE: A Demonstration of Player Modelling in Interactive Storytelling*. In Proceedings of the Fourth Conference on Artificial Intelligence and Interactive Digital Entertainment. AAAI Press. Stanford, California, USA, pages 226-227.
- 2007 David Thue and Vadim Bulitko and Marcia Spetch and Eric Wasylshen. *Learning Player Preferences to Inform Delayed Authoring*. In Proceedings of the AAAI Fall Symposium on Intelligent Narrative Technologies, volume Volume FS-07-05, pages 158-161. Arlington, Virginia.
- 2004 Greg Lee and Vadim Bulitko and Ilya Levner. *Automated Selection of Vision Operator Libraries with Evolutionary Algorithms*. In Proceedings of the Congress on Evolutionary Computing (CEC), pages 1127-1134. Portland, Oregon.
- 2003 Ilya Levner and Vadim Bulitko and Lihong Li and Greg Lee and Russell Greiner. *Automated Feature Extraction for Object Recognition*. In Proceedings of the Image and Vision Computing New Zealand conference (IVCNZ), pages 309-313. Palmerston North, New Zealand.
- 2003 Ilya Levner and Vadim Bulitko and Lihong Li and Greg Lee and Russell Greiner. *Learning Robust Object Recognition Strategies*. In Proceedings of the 8th Australian and New Zealand Conference on Intelligent Information Systems (ANZIIS), pages 489-494. Sydney, Australia.
- 2003 Lihong Li and Vadim Bulitko and Russell Greiner and Ilya Levner. *Improving an Adaptive Image Interpretation System by Leveraging*. In Proceedings of the 8th Australian and New Zealand Conference on Intelligent Information Systems (ANZIIS), pages 501-506. Sydney, Australia.

- 2003 Vadim Bulitko. *Lookahead Pathologies and Meta-level Control in Real-time Heuristic Search*. In Proceedings of the 15th Euromicro Conference on Real-Time Systems, pages 13-16. Porto, Portugal.
- 2000 Gunnar Schrah and Oleksandr Chernyshenko and Michael Baumann and Janet Sniezek and Vadim Bulitko and Scott Borton and David C. Wilkins. *A New Approach to Scoring Dynamic Decision Making Performance on High Fidelity Simulators: Reliability and Validity Issues*. In Proceedings of the 15th Annual Conference for the Society for Industrial and Organizational Psychology. New Orleans, Louisiana.
- 1993 Vadim Bulitko. *On Recursive Function Classes Including All Fixed Points*. In Proceedings of the Odessa State University Student Conference. Odessa, Ukraine.
- 1992 Vadim Bulitko. *A New Method of Constructing Hyper-simple Sets*. In Proceedings of the Ukrainian National Scientific Conference. Odessa, Ukraine.

### Invited Journal Articles (not peer-reviewed)

- 2016 Vadim Bulitko and David Thue. *A Call for Flow Modeling in Interactive Storytelling*. Advances in Cognitive Systems, Cognitive Systems Foundation, volume 4, 25–34.

### Technical Reports (not refereed)

- 2015 Vadim Bulitko and Jessica Hong and Kumar Kumaran and Ivan Swedberg and William Thoang and Patrick von Hauff and Georg Schmolzer. *RETAIN: a Neonatal Resuscitation Trainer Built in an Undergraduate Video-Game Class*. arXiv:1507.00956 [cs.CY].
- 2014 Vadim Bulitko. *Flow for Meta Control*. arXiv:1407.4709 [cs.AI].
- 2013 Daniel Huntley and Vadim Bulitko. *Search-Space Characterization for Real-time Heuristic Search*. arXiv:1308.3309 [cs.AI].
- 2009 Valeriy K. Bulitko and Vadim Bulitko. *On Backtracking in Real-time Heuristic Search*. arXiv:0912.3228 [cs.AI].
- 2004 Vadim Bulitko. *Learning for Adaptive Real-time Search*. arXiv:cs/0407016 [cs.AI].
- 2000 Vadim Bulitko. *Oracle Complexity and Nontransitivity in Pattern Recognition*. arXiv:cs/0010023 [cs.CC].

### Demonstrations

- 2015 Michael Cook and Squirrel Eiserloh and Justus Robertson and R. Michael Young and Tommy Thompson and David Churchill and Martin Cerny and Sergio Poo Hernandez and Vadim Bulitko. *Playable Experiences at AIIDE 2015*. In the Playable Experience track at the Eleventh AAAI Conference on Artificial Intelligence and Interactive Digital Entertainment (AIIDE), pages 227-231.
- 2014 Alejandro Ramirez and Vadim Bulitko. *Player-specific Automated Storytelling*. In the Playable Experience track at the Tenth AAAI Conference on Artificial Intelligence and Interactive Digital Entertainment (AIIDE), pages 206-207.
- 2008 David Thue and Vadim Bulitko and Marcia Spetch. *PaSSAGE: A Demonstration of Player Modelling in Interactive Storytelling*. In the Playable Experience track at the Fourth AAAI Conference on Artificial Intelligence and Interactive Digital Entertainment (AIIDE).

### Dissertations

- 2000 Vadim Bulitko. *Envisionment-based Scheduling Using Time Interval Petri Networks: Representation, Inference, and Learning*. Ph.D. dissertation. University of Illinois at Urbana-Champaign. Pages 338.
- 1998 Vadim Bulitko. *Minerva-5: A Multifunctional Dynamic Expert System*. M.Sc. dissertation. University of Illinois at Urbana-Champaign. Pages 190.

### Editorial

- 2011 Vadim Bulitko and Mark Riedl (editors). *Proceedings of the Seventh AAAI Conference on Artificial Intelligence and Interactive Digital Entertainment (AIIDE)*. AAAI Press. Stanford, California. Pages 240.
- 2010 G. Michael Youngblood and Vadim Bulitko (editors). *Proceedings of the Sixth AAAI Conference on Artificial Intelligence and Interactive Digital Entertainment (AIIDE)*. AAAI Press. Stanford, California. Pages 227.
- 2009 Vadim Bulitko and J. Christopher Beck (editors). *Proceedings of the Eight Symposium on Abstraction, Reformulation, and Approximation (SARA)*. AAAI Press. Lake Arrowhead, California. Pages 200.
- 2005 Vadim Bulitko and Sven Koenig (editors). *Proceedings of the Workshop on Planning and Learning in A Priori Unknown or Dynamic Domains at the International Joint Conference on Artificial Intelligence (IJCAI)*. Edinburgh, Scotland. Pages 162.

## Theses by my students

- 2015 Sergio Poo Hernandez. *Keeping PACE: Appraising Emotions to Enhance Gaming Experience*. M.Sc. thesis. Department of Computing Science. University of Alberta. Edmonton, Alberta.
- 2015 Yathirajan Brammadesam Manavalan. *A Light-weight Emotion Model for Non-Player Characters in a Video Game*. M.Sc. thesis. Department of Computing Science. University of Alberta. Edmonton, Alberta.
- 2015 Thórey Mariúsdóttir. *Flow as a Metacontrol for AI Agents*. M.Sc. thesis. Department of Computing Science. University of Alberta. Edmonton, Alberta.
- 2015 David Thue. *Generalized Experience Management*. Ph.D. thesis. Department of Computing Science. University of Alberta. Edmonton, Alberta. [Nominated for the departmental thesis award.]
- 2013 Alejandro Ramirez. *Automated Planning and Player Modelling for Interactive Storytelling*. M.Sc. thesis. Department of Computing Science. University of Alberta. Edmonton, Alberta.
- 2012 Greg Lee. *Automated Story-based Commentary for Sports*. Ph.D. thesis. Department of Computing Science. University of Alberta. Edmonton, Alberta.
- 2011 Andrew Cenknier. *Passing a Hide and Seek Turing Test*. M.Sc. thesis. Department of Computing Science. University of Alberta. Edmonton, Alberta.
- 2011 Daniel Huntley. *Performance Analysis of Recent Real-time Heuristic Search Through Search-Space Characterization*. M.Sc. thesis. Department of Computing Science. University of Alberta. Edmonton, Alberta.
- 2009 Stephen Hladky. *Predicting Opponent Locations in First-Person Shooter Video Games*. M.Sc. thesis. Department of Computing Science. University of Alberta. Edmonton, Alberta. [Nominated for the departmental thesis award.]
- 2009 Jieshan Lu. *Learning Multi-agent Pursuit of a Moving Target*. M.Sc. thesis. Department of Computing Science. University of Alberta. Edmonton, Alberta.
- 2008 D. Chris Rayner. *Analysing Openings in Tactical Simulations*. M.Sc. thesis. Department of Computing Science. University of Alberta. Edmonton, Alberta.
- 2007 David Thue. *Player-informed Interactive Storytelling*. M.Sc. thesis. Department of Computing Science. University of Alberta. Edmonton, Alberta. [Nominated for the departmental thesis award.]
- 2006 Cosmin Paduraru. *Planning with Approximate and Learned Models of Markov Decision Processes*. M.Sc. thesis. Department of Computing Science. University of Alberta. Edmonton, Alberta.
- 2004 Lihong Li. *Focus of Attention in Reinforcement Learning*. M.Sc. thesis. Department of Computing Science. University of Alberta. Edmonton, Alberta.
- 2004 Greg Lee. *Automated Action Set Selection in Markov Decision Processes*. M.Sc. thesis. Department of Computing Science. University of Alberta. Edmonton, Alberta.
- 2003 Ilya Levner. *Multi-resolution Adaptive Object Recognition: A Step Towards Autonomous Vision Systems*. M.Sc. thesis. Department of Computing Science. University of Alberta. Edmonton, Alberta.

## Media/industry reports on our work

- May 4, 17 Erik Einsiedel. *Creating the Game*. Curious Arts. University of Alberta.
- Apr 28, 17 Peter Watts. *Radio interview about CMPUT 250*. News Talk 770 Radio. Calgary, Alberta.
- Apr 27, 17 Katie Willis. *Technology meets artistry at video game development awards 2017*. Faculty of Science News, University of Alberta.
- Oct 26, 16 Keith Stuart. *Has a Black Mirror episode predicted the future of video games?* The Guardian.
- Mar 17, 16 Chris Higgins. *Will humans lose out to AI in eSports too?* eSports. Redbull.com.
- Nov 18, 15 Jennifer Pascoe. *Video Game Trainer Built to Save Lives in the Delivery Room*. Science Contours, Volume 32, Number 2. University of Alberta.
- Oct 8, 15 Nella Callihoo. *REsuscitation TrAining for neonatal residents not just a game*. Uplifting the Whole People – Legislative Newsletter, University of Alberta.
- Sep 30, 15 Andrea Ross. *Video game training developed by U of A students teaches people how to resuscitate newborns*. Metro News Edmonton.
- Sep 29, 15 Kate McInnes. *Video game developed at U of A could be a life-saver*. The Gateway.

- Sep 17, 15 Madeleine Cummings. *University of Alberta students develop video game training aid for neonatal physicians.* Edmonton Journal.
- Sep 17, 15 Kevin Maimann. *Edmonton students develop video game that can save lives.* Edmonton, Calgary and Winnipeg Sun.
- Sep 17, 15 Ashley Molnar. *Video game helps with neonatal care.* CTV News, Edmonton.
- Sep 17, 15 Su-ling Goh. *Video game trains health professionals to revive newborn babies.* Global News, Edmonton.
- Sep 17, 15 Jennifer Pascoe and Ross Neitz. *Neonatal resuscitation trainer RETAIN built in undergraduate computer gaming class.* Faculty of Medicine and Dentistry News, University of Alberta.
- Sep 17, 15 Jennifer Pascoe. *Neonatal resuscitation trainer RETAIN built in undergraduate computer gaming class.* Faculty of Science News, University of Alberta.
- Apr 27, 15 Brian Perry. *Interview with Vadim Bulitko.* Project Spark blog, Microsoft.
- Feb 1, 15 Karen White. *Tragedy Averted in iGiselle Video Game.* Dance Studio Life magazine.
- May 19, 14 Shandi Shiach. *Classic romantic ballet recreated in video game form.* The Gateway, University of Alberta.
- May 1, 14 Doug Johnson. *CMPUT 250 brings different University of Alberta faculties together to create video games.* Edmonton Examiner.
- Apr 25, 14 Conal Pierce. *It takes a village to make the game.* BioWare community blog.
- Apr 25, 14 Laura Ly. *Computer game awards showcase students' combined talents.* University of Alberta News.
- Apr 25, 14 Trevor Robb. *Top of their game.* Edmonton Sun.
- Mar 27, 14 Stephanie Dubois. *University of Alberta created video game focuses on Romantic ballet Giselle.* Metro News Edmonton.
- Mar 21, 14 Geoff McMaster. *Video game allows player to rewrite tragic demise of ballet heroine.* University of Alberta Folio.
- Mar 9-15, 14 Sarah Hoyles. *Ballet Video Game.* CKUA ArtBeat.
- May 3, 13 Shanda Wood. *The 5th Annual CMPUT 250 Game Development Awards.* BioWare community blog.
- Apr 24, 13 Matt Dykstra. *Students from University of Alberta honoured for video game projects.* Edmonton Sun.
- Nov 9, 12 Greg Lee interviewed by Patrick Skahill. *Computer Programmer Aims to Help Sports Broadcasters.* WNPR Connecticut.
- Oct 27, 12 Greg Lee interviewed by Nora Young. *AI Sports Commentating.* CBC Radio Spark Episode 194. New machine will deliver sports anecdotes. DN.se Sport.
- Oct 8, 12 Stanislav Mihulka. *Virtual sports commentator for tomorrow.* Object Source E-Learning.
- Oct 8, 12 Douglas Heaven. *AI sports commentator knows all the best stories.* New Scientist.
- Oct 6, 12 James Trew. *Alt-week 10.6.12: supercomputers on the moon, hear the Earth sing and the future of sports commentary.* Engadget.
- Oct 5, 12 Chris Welch. *Artificial intelligence hopes to give sports commentators an assist.* The Verge.
- Jul 15, 12 Andrew Katz. *Never loose your wallet again!* Men's Health.
- Jul 2, 12 Meghan Holohan. *Where to hide your wallet so that you can find it later.* MSNBC.
- Jun 4, 12 Shlomo Sprung. *A popular kids game could be used to figure out where terrorists hide bombs.* Business Insider.
- Jun 1, 12 Charles Choi. *Hide-and-seek goes virtual.* Science NOW.
- May 15, 12 Ross Pomeroy. *Scientists study how humans hide and seek.* Real Clear Science.
- May 4, 12 *The 4th annual CMPUT 250 Game Development Awards.* BioWare Blog.
- Apr 26, 12 *UofA computer games.* Breakfast Television, City TV.
- Apr 26, 12 Kevin Maimann. *U of A gamers win Milestone's game of the year.* 24 Hours Edmonton.
- Apr 25, 12 Kevin Maimann. *Local gamers win award.* Edmonton Sun.
- Apr 25, 12 Brian Murphy. *Student video game developers show their stuff.* University of Alberta News and Events.
- Apr 21, 11 Shelley Williamson. *U of A crowns gurus of game design.* Metro Edmonton.
- Apr 8, 11 Scott Rollans. *U of A gamers take to the red carpet.* Folio.
- Apr 2, 11 Scott Rollans. *Gamers take centre stage at gala.* U of A Faculty of Science News.

- Sep 10, 09 Sean Steels. *Researchers probe human mind to unlock A.I.* The Gateway, University of Alberta.
- Sep 10, 09 *Child's play may revolutionize video gaming, police work.* ScienceBlog.
- Sep 2, 09 *Child's play may revolutionize video gaming, police work.* Breaking News 24/7.
- Sep 2, 09 *Hide-'n-seek reveals tricks video game makers might use.* LiveScience.
- Sep 2, 09 *Child's play may revolutionize video gaming, police work.* ScienceDaily.
- Sep 2, 09 *Reasoning behind hide and seek to revolutionise video gaming, police work.* Gadgetophilia.
- Sep 2, 09 *Researchers Use Hide-And-Seek To Study Reasoning, Decision-Making.* All Headline News.
- Sep 1, 09 BJS. *Child's play may revolutionize video gaming, police work.* ScienceNews
- Sep 1, 09 Anna Błońska. *Pouczająca zabawa w chowanego.* KopalniaWiedzy.pl.
- Sep 1, 09 David Wylie. *'Hide-and-seek' software could train people to snoop.* Canwest News Service.
- Aug 28, 09 *Child's play may revolutionize video gaming, police work.* PhysOrg.com.
- Aug 28, 09 Jamie Hanlon. *Child's play may revolutionize video gaming, police work.* Express News, University of Alberta.

## Presentations

- Feb 28, 18 *Deep Learning, Artificial Evolution and Novel AI Behaviors.* Leonardo Art Science Evening Rendezvous, Edmonton, Alberta.
- Jan 25, 18 *Towards Novel Behavior in Evolving AI Agents.* Poster presentation and a demo at Dark Matters: Game On. Telus World of Science. Edmonton, Alberta.
- Nov 7, 17 *Evolution of AI Agents.* INTD 240, University of Alberta.
- Nov 3, 17 *Towards Procedurally Generating Interesting NPCs.* BioWare, Edmonton, Alberta.
- Oct 20, 17 *AI for Experience Management.* HUCO 617, University of Alberta.
- Oct 8, 17 *Robustness of Real-time Heuristic Search Algorithms to Read/Write Error in Externally Stored Heuristics.* AIIDE poster presentation. Snowbird, Utah.
- Oct 6, 17 *Towards Positively Surprising AI Characters.* AIIDE Workshop on Experimental AI in Games. Snowbird, Utah.
- Oct 5, 17 *Effects of Self-knowledge: Once Bitten Twice Shy.* AIIDE Workshop on Experimental AI in Games. Snowbird, Utah.
- Sep 22, 17 *Towards Positively Surprising AI Characters.* CogSem, Department of Psychology. University of Alberta. Edmonton, Alberta.
- May 18, 17 *AI-driven Experience Management for Fun and Training.* Digital Narratives Around the World. KIAS Symposium. University of Alberta. Edmonton, Alberta.
- Mar 17, 17 *Navigation and search behaviour in Sonoran desert ants.* CogSem, Department of Psychology. University of Alberta. Edmonton, Alberta.
- Nov 16, 16 *AI for Experience Management.* HUCO 617, University of Alberta.
- Nov 2, 16 *Flow.* RLAI, University of Alberta.
- Nov 1, 16 *AI for Experience Management.* EDPY 597, University of Alberta.
- Nov 1, 16 *AI for Experience Management.* EDIT 486, University of Alberta.
- Oct 12, 16 *Searching for Real-time Search Algorithms: An Open Challenge.* Carnegie Mellon University, Silicon Valley Campus. Moffett Field, California.
- Oct 11, 16 *Per-map Algorithm Selection in Real-time Heuristic Search.* AIIDE 2016 poster presentation. Burlingame, California.
- May 20, 16 *AI-driven Experience Management for Fun and Training.* Department of Computer Science. University of British Columbia. Vancouver, British Columbia.
- May 19, 16 *AI-driven Experience Management for Fun and Training.* Department of Computer Science. University of Victoria. Victoria, British Columbia.
- Apr 26, 16 *Searching for Real-time Search Algorithms.* Heuristic Search Seminar, Department of Computing Science. University of Alberta. Edmonton, Alberta.
- Nov 23, 15 *AI-driven Experience Management for Fun and Training.* Carnegie Mellon University, Silicon Valley Campus. Moffett Field, California.

- Nov 17, 15 *Maximizing Flow as a Metacontrol in Angband*. AIIDE 2015 poster presentation. Santa Cruz, California.
- Nov 9, 15 *A Computational Model of Emotions and Actions*. University of California Santa Cruz.
- Oct 19, 15 *ACORE: A Lightweight Computational Emotion Model*. University of California Santa Cruz.
- Oct 6, 15 *Recent Work in Real-time Heuristic Search*. Heuristic Search Seminar, Department of Computing Science. University of Alberta. Edmonton, Alberta.
- May 28, 15 *A Call for Flow Modeling in Interactive Storytelling*. CMN Workshop. Atlanta, Georgia.
- Mar 26, 15 *Flow Modeling for AI-managed Interactive Storytelling*. CSGSA Academic and Industry Mixer, Department of Computing Science. University of Alberta. Edmonton, Alberta.
- Mar 17, 15 *Enjoying The Search*. Heuristic Search Seminar, Department of Computing Science. University of Alberta. Edmonton, Alberta.
- Feb 5, 15 *Interactive Storytelling, Artificial Intelligence and iGiselle*. Invited talk at Arts-based Research Studio, Department of Secondary Education. University of Alberta. Edmonton, Alberta.
- Jan 16, 15 *Computational Models of Flow*. Invited talk at CogSem, Department of Psychology. University of Alberta. Edmonton, Alberta.
- Oct 24, 14 *iGiselle: Modeling Player's Emotions for Interactive Storytelling*. Interdisciplinary Colloquium. University of Alberta, Edmonton, Alberta.
- Oct 8, 14 *From Human Writers to AI Experience Managers*. Liquid Narrative Group. North Carolina State University. Raleigh, North Carolina.
- Oct 6, 14 *PAST: Player-Specific Automated Storytelling*. A playable experience spotlight presentation at the AAAI conference on AI and Interactive Digital Entertainment (AIIDE). Raleigh, North Carolina.
- Oct 6, 14 *Emotion-based Interactive Storytelling with AI*. A poster spotlight presentation at the AAAI conference on AI and Interactive Digital Entertainment (AIIDE). Raleigh, North Carolina.
- Sep 29, 14 *Managing Interactive Experience with Artificial Intelligence*. Invited talk for Computational Media and Design program. University of Calgary. Alberta.
- Sep 12, 14 *Interactive Storytelling for Fun and Training*. Invited talk at CogSem, Department of Psychology. University of Alberta. Edmonton, Alberta.
- Aug 23, 14 *AI-based Interactive Experience Management*. Invited keynote at Replaying Japan conference. University of Alberta. Edmonton, Alberta.
- Aug 4, 14 *Flow for Meta Control*. Special Session on Artificial General Intelligence and Cognitive Science. AGI 2014. Quebec City, Quebec.
- Jul 23, 14 *Flow for Meta Control*. University of Alberta. Edmonton, Alberta.
- Apr 7, 14 *AI-based Interactive Experience Management*. GRAND workshop invited talk. University of Alberta. Edmonton, Alberta.
- Nov 30, 13 *Experience Management with Artificial Intelligence*. DiscoverE Open House. University of Alberta. Edmonton, Alberta.
- Nov 8, 13 *iGiselle*. University of Alberta Interactives. Edmonton, Alberta.
- Oct 18, 13 *Experience Management with Artificial Intelligence*. Lockheed Martin. Boston, Massachusetts.
- Oct 15, 13 *Experience Management with Artificial Intelligence*. MIT Media Lab. Boston, Massachusetts.
- Jul 22, 13 *Flow and Reinforcement Learning*. University of Alberta. Edmonton, Alberta.
- May 6, 13 *Learning Player Preferences for Better Interactive Stories*. University of Alberta International. Edmonton, Alberta.
- May 3, 13 *Learning Player Preferences for Better Interactive Stories*. University of Alberta Liberal Arts Day. Edmonton, Alberta.
- Apr 3, 13 *Learning Player Preferences for Better Interactive Stories*. University of Alberta Interactives. Edmonton, Alberta.
- Jan 22, 13 *Discovery Panel on Games, Machines, and Artificial Intelligence*. University of Alberta. Edmonton, Alberta.
- Dec 8, 12 *Flow Maximization for Optimizing Performance*. The First Annual Conference on Advances in Cognitive Systems. Palo Alto, California.

- Oct 11, 12 *On Case Base Formation in Real-time Heuristic Search*. The 8th AAAI Conference on Artificial Intelligence and Interactive Digital Entertainment. Stanford, California.
- Oct 10, 12 *Automated Story-based Commentary for Sports*. The 8th AAAI Conference on Artificial Intelligence and Interactive Digital Entertainment. Stanford, California.
- Feb 27, 12 *Fast Pathfinding through Subgoaling*. BioWare. Edmonton, Alberta.
- Feb 2, 12 *Building and Evaluating an AI Game Master*. Thompson Rivers University. Kamloops, British Columbia.
- Dec 2, 11 *Building and Evaluating an AI Game Master*. University of British Columbia Okanagan. Kelowna, British Columbia.
- Dec 1, 11 *Subgoaling in Real-time Heuristic Search*. University of British Columbia Okanagan. Kelowna, British Columbia.
- Nov 23, 11 *Subgoaling in Real-time Heuristic Search*. University of Alberta. Edmonton, Alberta.
- Nov 19, 11 *Building and Evaluating an AI Game Master*. Pure Speculation conference invited talk. Edmonton, Alberta.
- Nov 18, 11 *Building and Evaluating an AI Game Master*. University of Alberta. Edmonton, Alberta.
- Jun 17, 11 *CMPUT 250: Computers and Games*. STLHE 11. Saskatoon, Saskatchewan.
- Nov 3, 10 *Player Agency and the Relevance of Decisions*. The Third International Conference on Interactive Digital Storytelling. Edinburgh, Scotland.
- Oct 14, 10 *Agency for Everyone: A New Focus for the PaSSAGE Project*. UC Santa Cruz. Santa Cruz, California.
- Apr 1, 10 *Impressions of GDC 10*. University of Alberta. Edmonton, Alberta.
- Oct 15, 09 *kNN LRTA\*: Simple Subgoaling for Real-time Search*. The Fifth Artificial Intelligence for Interactive Digital Entertainment Conference. Stanford, California.
- Aug 3, 09 *PaSSAGE: Past, Present, and the Road Ahead*. Google, Mountain View, California.
- Jul 31, 09 *PaSSAGE: Past, Present, and the Road Ahead*. Disney Imagineering, Glendale, California.
- Jul 20, 09 *How to Avoid Learning*. University of Alberta. Edmonton, Alberta.
- May 8, 09 *Computers and Games*. Inaugural "Wired Campus Alberta" broadcast to nine Alberta high schools. Edmonton, Alberta.
- Nov 15, 08 *PaSSAGE: Past, Present, and the Road Ahead*. Reykjavik University. Reykjavik, Iceland.
- Nov 12, 08 *PaSSAGE: Past, Present, and the Road Ahead*. Crowd Control Productions. Reykjavik, Iceland.
- Oct 22, 08 *Modeling Culturally and Emotionally Affected Behavior*. The fourth AAAI Conference on Artificial Intelligence and Interactive Digital Entertainment. Stanford, California.
- Oct 16, 08 *Modeling Culturally and Emotionally Affected Behavior*. Reykjavik University. Reykjavik, Iceland.
- Sep 3, 08 *Dynamic Control in Real-Time Heuristic Search*. Reykjavik University. Reykjavik, Iceland.
- Jul 29, 08 *Modeling Culturally and Emotionally Affected Behavior*. University of British Columbia Okanagan. Kelowna, British Columbia.
- Jul 28, 08 *Dynamic Control in Real-Time Heuristic Search*. University of British Columbia Okanagan. Kelowna, British Columbia.
- Jul 18, 08 *Dynamic Control in Real-Time Heuristic Search*. Nara Institute of Science and Technology (NAIST). Nara, Japan.
- Jul 16, 08 *Dynamic Control in Real-Time Heuristic Search*. Future University. Hakodate, Japan.
- Jul 11, 08 *Modeling Culturally and Emotionally Affected Behavior*. Workshop at 10th International Conference on Simulation of Adaptive Behavior. Osaka, Japan.
- Jul 7, 08 *Simulating the Adaptive Behaviour of Storytellers in Computer Video Games*. The 10th International Conference on Simulation of Adaptive Behavior. Osaka, Japan.
- Aug 23, 07 *Culturally Affected Behavior (CAB) and Culture, EMotion and Adaptation (CEMA)*. USC Institute for Creative Technologies (ICT). Marina del Rey, California.
- Jul 21, 07 *State Abstraction in Real-time Heuristic Search*. Invited talk at the Seventh International Symposium on Abstraction, Refinement, and Approximation (SARA). Whistler, British Columbia.
- Jun 1, 07 *State Abstraction in Learning Real-time Heuristic Search*. Stanford University, California.
- Jul 26, 06 *Machine Learning for Pursuit in Computer Games*. Université de Montréal, Montreal, Quebec.



- Jul 25, 06 *Learning to Pursue*. McGill University, Montreal, Quebec.
- Jun 20, 06 *Real-time Search and Learning*. Institute for Creative Technologies (ICT), Marina del Rey, California.
- Jun 9, 06 *Real-time Search in Game-like Environments*. Bioware Corp. Edmonton, Alberta.
- Jun 7, 06 *Target Modeling in Real-time Moving Target Pursuit*. Reykjavik University. Reykjavik, Iceland.
- May 19, 06 *Real-time Learning and Search*. University of British Columbia, Vancouver, British Columbia.
- May 18, 06 *Machine Learning for Computer Vision*. University of British Columbia, Vancouver, British Columbia.
- Aug 25, 05 *Recent Developments in Learning Real-time Search and Their Applications to Real-time Path-finding*. Institut d'Investigació en Intel·ligència Artificial, Bellaterra, Spain.
- Feb 22, 05 *Automated Instructor Assistant for Ship Damage Control*. Institute for Creative Technologies (ICT), Marina del Rey, California.
- Feb 05 *Speeding Up Learning via Abstraction*. Institute for Creative Technologies (ICT), Marina del Rey; University of California Berkeley, Berkeley; University of California, Los Angeles (UCLA); Information Science Institute (ISI), Marina del Rey; University of Southern California (USC), Los Angeles, California.
- Aug 27, 04 *Machine Learning for Adaptive Vision*. National Aeronautics and Space Administration (NASA), Moffett Field, California.
- Aug 26, 03 *Lookahead Pathologies and Meta Reasoning in Real-time Decision Making*. University of Southern California (USC), Los Angeles, California.

## Funding

### Research

|       |   |                                |
|-------|---|--------------------------------|
| 17-19 | <b>KIAS Research Cluster Grant</b>                    | \$55,000   co-applicant        |
| 14-18 | <b>NSERC discovery grant</b>                          | \$39,000/year   solo applicant |
| 13-14 | <b>KIAS Research Cluster Grant</b>                    | \$20,000   collaborator        |
| 09-13 | <b>NSERC discovery grant</b>                          | \$35,000/year   solo applicant |
| 05    | <b>UofA international work study program grant</b>    | \$2,448   solo applicant       |
| 04-08 | <b>NSERC discovery grant</b>                          | \$15,000/year   solo applicant |
| 04    | <b>NSERC research tools &amp; instruments grant</b>   | \$8,397   solo applicant       |
| 02-03 | <b>NSERC discovery grant</b>                          | \$10,000/year   solo applicant |
| 02    | <b>UofA summer temporary employment program grant</b> | \$2,082   solo applicant       |
| 01-03 | <b>UofA start-up grant</b>                            | \$26,667/year   solo applicant |

### Teaching

|            |                |                                |
|------------|----------------|--------------------------------|
| 16, 17     | <b>BioWare</b> | \$10,000/year   solo applicant |
| 11, 13, 14 | <b>BioWare</b> | \$2,000/year   solo applicant  |

## Awards

- 11 Alan Blizzard Award, Second Place
- 10, 11 AAAI Certificate of Appreciation
- 06, 07, 10 "Top echelon teacher" mention by Faculty of Science Dean, University of Alberta
- 99 IAAI Innovative Application Award by AAAI

## Collaboration

- 17 - present **Humanities Computing, University of Alberta, Edmonton, Alberta.**  
Developing and applying Deep Learning to speech accent identification.
- 17 - Present **Department of Fine Arts, University of Alberta, Edmonton, Alberta.**  
Collaborating on LASERAlberta and EVE2050 projects.
- 17 - Present **Compute Canada, University of Alberta, Edmonton, Alberta.**  
AI for A-life-style agents.

- 17 **Department of Chemistry, University of Alberta, Edmonton, Alberta.**  
Developing a community service learning project for an undergraduate class.
- 17 - Present **BioWare/EA, Edmonton, Alberta.**  
Exploring AI/ML in games.
- 17 **TrajectoryIQ, Edmonton, Alberta.**  
Developing a community service learning project for an undergraduate class.
- 16 - present **Department of Biological Sciences, University of Alberta, Edmonton, Alberta.**  
Developing and applying Deep Learning to bioacoustic data for species identification and biodiversity studies.
- 16 **Town of Canmore, Canmore, Alberta.**  
Discussed a community service learning project for an undergraduate class.
- 16 - present **Department of Music, University of Alberta, Edmonton, Alberta.**  
Developing and applying Deep Learning to ethomusical data to identify ethnic and cultural attributes of music recordings.
- 15 - 16 **Carnegie Mellon University, Silicon Valley Campus, Moffett Field, California.**  
Worked on non-negative matrix factorization for played modeling in training systems.
- 15 - 16 **University of California Santa Cruz, Santa Cruz, California.**  
Worked on AI/ML for player modeling and scenario management in training systems.
- 14 - 16 **Royal Alexandra Hospital, Faculty of Medicine and Dentistry, UofA, Edmonton, Alberta.**  
Worked on AI/ML for player modeling and scenario management in training systems.
- 13 - 15 **Department of English and Film Studies, University of Alberta, Edmonton, Alberta.**  
Developed AI for player modeling and experience management. Directed development of *iGiselle*.
- 09 - 13 **University of British Columbia Okanagan, Kelowna, British Columbia.**  
Developed real-time heuristic search algorithms.
- 07 - 10 **Reykjavik University, Reykjavik, Iceland.**  
Developed real-time heuristic search algorithms.
- 07 **USC Institute for Creative Technologies (ICT), Marina del Rey, California.**  
Developed and intergrated computational models for culturally and emotionally affected behavior.
- 06 - present **Department of Psychology, University of Alberta, Edmonton, Alberta.**  
Developed computational models for cognitive behavior in humans and other animals.
- 06 - 15 **BioWare Corp., Edmonton, Alberta.**  
Discussed AI algorithms.
- 05 - 08 **Jožef Stefan Institute, Ljubljana, Slovenia.**  
Developed real-time heuristic search algorithms.
- 05 **Institut d'Investigació en Intel.ligència Artificial, Bellaterra, Spain.**  
Developed real-time heuristic search algorithms.
- 05 **University of Southern California, Los Angeles, California.**  
Developed real-time heuristic search algorithms.
- 04 - 06 **Syncrude Research, Ltd., Edmonton, Alberta.**  
Worked on AI/ML models.
- 03 **Cross Cancer Institute, Edmonton, Alberta.**  
Worked on AI/ML models for brain tumor growth/recognition.
- 02 **Canadian Forestry Service, Pacific Forestry Centre, Victoria, British Columbia.**  
Developed AI/ML algorithm for tree identificiation in aerial photographs.
- 01 **Alberta Research Council, Vegreville, Alberta.**  
Developed AI/ML algorithm for tree identificiation in aerial photographs.

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## Service

### International

- 18 **Conference co-chair, SoCS conference.**
- 15 **Tenure case reviewer, a US university.**

- 11 **Conference chair**, *AIIDE conference*.
- 10 **Panelist**, *Symposium on Narrative Intelligence*, University of California Santa-Cruz.
- 10-present **Member**, *Steering Committee*, AIIDE conference.
- 10 **Program chair**, *AIIDE conference*.
- 10 **Member**, *Organizing Committee*, AAAI workshop on AI and fun.
- 10 **Member**, *Advisory Board*, AAMAS workshop.
- 09-12 **Member**, *Steering Committee*, SARA symposium.
- 09 **Member**, *Organizing Committee*, AIIDE conference.
- 09 **Co-chair**, *SARA symposium*.
- 06 **Member**, *Organizing Committee*, ECAI workshop.
- 06 **Workshop and Tutorial Chair**, *ICML*.
- 05 **Co-chair**, *IJCAI workshop*.

### National

- 16 **Accreditation Committee Member**, *BC Ministry of Advanced Education*, Vancouver, British Columbia.

### Local

- 17 **Event Host**, *Leonardo Art, Science, Evening Rendezvous (LASER) Talk*, Edmonton, Alberta.
- 17 **Member**, *EVE2050 Project at the University of Alberta*, Edmonton, Alberta.
- 17 **Committee Member**, *Leonardo Art, Science, Evening Rendezvous (LASER) at the University of Alberta*, Edmonton, Alberta.
- 17 **Panelist**, *Intersections of Gaming and Gambling*, Edmonton, Alberta.
- 17 **Panelist**, *CIPS panel on Ethics and AI*, Edmonton, Alberta.
- 16-present **Member**, *Industry Liaison Committee*, University of Alberta.
- 15 **Panelist**, *Game Discovery Exhibition (GDX)*, Edmonton, Alberta.
- 15 **Panel commentator**, *MLCS Graduate Student Conference*, University of Alberta.
- 14-15 **Director**, *CS Internship Program*, University of Alberta.
- 13-14 **Member**, *Faculty of Education Council*, University of Alberta.
- 11-12 **Coordinator**, *Distinguished Lecture Series*, University of Alberta.
- 10-15,17 **Producer, MC**, *CMPUT 250 Annual Game Award Ceremony*, Edmonton, Alberta.
- 10 **Member**, *Queen Elizabeth II Scholarship Selection Committee*, University of Alberta.
- 09-15 **Member**, *Faculty of Extension Council*, University of Alberta.
- 09-11 **Member**, *Graduate Program Committee*, University of Alberta.
- 08-09, 12-14 **Member**, *Undergraduate Curriculum Committee*, University of Alberta.
- 02 **Chair**, *Quantum Computing Summer School*, University of Alberta.

### Reviewing

- 16 **Reviewer**, *Mathematical Problems in Engineering Journal*.
- 16 **Reviewer**, *Journal of Entertainment Computing*.
- 14 **Reviewer**, *Game AI Pro 2 book*.
- 14-15 **PC member**, *INT workshop*.
- 14 **Senior PC member**, *FDG conference*.
- 13 **Reviewer**, *Advances in Artificial Intelligence journal*.
- 13 **PC member**, *IEEE Computational Intelligence for Human-like Intelligence symposium*.
- 12 **Award committee member**, *AIIDE conference*.
- 11-13 **PC member**, *FDG conference*.
- 11 **Senior PC member**, *IJCAI conference*.
- 10-11 **PC member**, *SoCS symposium*.

- 10-11 **PC member**, *ICAPS workshop*.
- 09, 12, 14-15, 17 **Reviewer**, *IEEE transactions on computational intelligence and AI in games*.
- 08, 12, 14-17 **PC member**, *AIIDE conference*.
- 08, 11-12, 14-15 **PC member**, *FLAIRS conference*.
- 07 **PC member**, *ICRA conference*.
- 07-08, 11, 13, 15-16 **Reviewer**, *JAIR*.
- 06 **Reviewer**, *Morgan Kaufmann publishers, Elsevier*.
- 06-08, 12, 16-17 **PC member**, *AAAI conference*.
- 05, 06, 09-10, 14 **Reviewer**, *AI journal*.
- 05, 07, 09 **PC member**, *IJCAI conference*.
- 05 **PC member**, *IVCNZ conference*.
- 04, 08 **PC member**, *ICML conference*.
- 04 **Guest editor**, *Computational Intelligence journal*.
- 04 **Reviewer**, *Springer-Verlag*.
- 04, 06, 10, 14 **Reviewer**, *NSERC*.
- 17 **Reviewer**, *An overseas funding foundation*.
- 17 **Reviewer**, *MITACS*.
- 04 **Reviewer**, *IEEE transactions on systems, man, and cybernetics, Part A*.
- 04 **Reviewer**, *IEEE transactions on systems, man, and cybernetics, Part B*.
- 03 **PC member**, *CIRA symposium*.
- 02 **PC member**, *CG conference*.
- 01 **PC member**, *Australian AI conference*.
- 01, 11 **Reviewer**, *ML journal*.
- 01 **Reviewer**, *Computational Intelligence journal*.
- 01 **Reviewer**, *Wiley*.

## Membership

- 02 - present **Associate Member**, *Alberta Machine Intelligence Institute (AMII) / Alberta Innovates Center for Machine Learning (AICML)*, Edmonton, Alberta.
- 96 - present **Member**, *Association for the Advancement of Artificial Intelligence (AAAI)*, Palo Alto, California.

## Hobbies (<http://bulitko.net>)

### Interests

- 81-present Ray tracing, drawing and painting: [http://bulitko.500px.com/non\\_photos](http://bulitko.500px.com/non_photos)
- 91-present Martial arts, jogging
- 81-present Weight lifting, cycling, hiking, travel and snorkeling
- 09-present R/C flying
- 94-present Film making:
  - <https://www.youtube.com/user/VadimBulitko/videos>
  - <http://www.imdb.com/name/nm7926176>
- 84-present Photography: <http://bulitko.500px.com>
- 82-present Fiction and poetry writing
- 00-16 Music composition and remixing: <https://soundcloud.com/vadim-bulitko>

### Membership

- 16-17 **Member**, *Latitude 53*, Edmonton, Alberta.
- 15-16 **Associate Member**, *Film And Video Arts society (FAVA)*, Edmonton, Alberta.
- 15-16 **Member**, *Writers' Guild of Alberta*, Edmonton, Alberta.

### Festival Selections, Public Screenings and Awards

- 17 **Edmonton Expo**, *The Dream Keeper*, Edmonton, Alberta.
- 17 **Gotta-Minute Film Festival**, *The Easter Snow*, Edmonton, Alberta.
- 17 **The EFMG Frigid Film Festival**, *The Dream Keeper*, Edmonton, Alberta.
- 17 **UK Screen One International Film Festival**, *Tibi Fide*, Leicester, UK.
- 17 **UK Screen One International Film Festival**, *The Autumn Station*, Leicester, UK.
- 17 **Toronto Short Film Festival**, *The Autumn Station*, Toronto, Ontario.
- 16 **Hollywood Screenings Film Festival**, *Tibi Fide: Semi-finalist*, Santa Monica, California.
- 16 **Canada Shorts Film Festival**, *Charge!: Award of Merit*, Saint John, New Brunswick.
- 16 **Canada Shorts Film Festival**, *Summer Time: Award of Merit*, Saint John, New Brunswick.
- 16 **Canada Shorts Film Festival**, *The Autumn Station: Honorable Mention*, Saint John, New Brunswick.
- 16 **Edmonton Short Film Festival**, *The Timelapse Etudes*, Edmonton, Alberta.
- 16 **Edmonton Short Film Festival**, *Charge!*, Edmonton, Alberta.
- 16 **Edmonton Expo**, *Script Dreams*, Edmonton, Alberta.
- 16 **Edmonton Expo**, *Tibi Fide*, Edmonton, Alberta.
- 16 **Edmonton Expo**, *Charge!*, Edmonton, Alberta.
- 16 **The Muskoka Independent Film Festival**, *Charge!*, Gravelhurst, Ontario.
- 16 **Diamond in the Rough Film Festival**, *Charge!*, Cupertino, California.
- 16 **The World's Independent Film Festival**, *The Autumn Station*, San Francisco, California.
- 16 **60 Seconds or Less Video Festival**, *Spring in California*, Chestertown, Maryland.
- 16 **FAVA Northwest Film Challenge**, *Charge!*, Edmonton, Alberta.
- 16 **Metro Shorts**, *The Autumn Station*, Edmonton, Alberta.
- 16 **Barcelona Planet Film Festival**, *Tibi Fide*, <http://barcelonaplanetfilmfestival.weebly.com/>.
- 16 **Best Shorts Competition**, *Spring in California*, La Jolla, California.
- 16 **Best Shorts Competition**, *The Autumn Station*, La Jolla, California.
- 16 **Best Shorts Competition**, *Tibi Fide*, La Jolla, California.
- 16 **Miniature Film Festival**, *The Autumn Station*, Vancouver, British Columbia.
- 16 **Metro Shorts**, *Spring in California*, Edmonton, Alberta.
- 15 **Shaw TV**, *Summer Time*, Edmonton, Alberta.
- 15 **FAVA Videokitchen**, *Summer Time*, Edmonton, Alberta.

- 15 **Metro Shorts**, *Summer Time*, Edmonton, Alberta.
- 15 **Edmonton Short Film Festival**, *Summer in Alberta*, Edmonton, Alberta.
- 15 **Gotta-Minute Film Festival**, *Particle Drift*, Edmonton, Alberta.
- 15 **Gotta-Minute Film Festival**, *Summer in Alberta*, Edmonton, Alberta.
- 15 **Gotta-Minute Film Festival, Kids Program**, *Summer in Alberta*, Edmonton, AB.
- Film-making Experience**
- 17 **DP, Editor**, *Vignettes of Kita No Taiko @ Beats!*, Edmonton, Alberta.
- 17 **DP, Editor, Producer**, *The Discount Factor*, Edmonton, Alberta.
- 17 **DP, Editor, Producer**, *The Escape*, San Francisco, California.
- 17 **DP, Editor**, *The Easter Snow*, Edmonton, Alberta.
- 17 **DP, Editor**, *Art Birthday @ BEAMS*, Edmonton, Alberta.
- 16 **DP, Editor**, *PAN Project Vignettes*, Edmonton, Alberta.
- 16 **Director, DP, Writer, Editor, Producer, Executive Producer**, *Script Dreams*, Edmonton, Alberta.
- 16 **Director, DP, Actor**, *UpStart*, Edmonton, Alberta.
- 16 **DP, Editor, Producer**, *The Timelapse Etudes*, Edmonton, Alberta.
- 16 **DP, Editor, Executive Producer**, *Charge!*, Edmonton, Alberta.
- 16 **DP, Editor, Executive Producer**, *The Dream Keeper*, Edmonton, Alberta.
- 16 **Actor, DP, Co-Producer**, *Mirroring*, Edmonton, Alberta.
- 15-16 **Writer, Director, DP, Editor, Producer**, *Tibi Fide*, Santa Cruz, California.
- 15-16 **Director, DP, Editor, Producer**, *The Autumn Station*, Edmonton, Alberta.
- 15-16 **DP, Editor, Producer**, *Spring in California*, California.
- 15 **DP, Editor, Producer**, *Luna*, Edmonton, Alberta.
- 15 **Director, DP, Editor, Producer**, *Summer Time*, Alberta.
- 15 **DP**, *My Love*, Edmonton, Alberta.
- 15 **Photographer, DP, Editor**, *Who Am I? The Unauthorized Stories from the Varscona Parkade*, Toy Guns Dance Theatre, Edmonton, Alberta.
- 15 **DP**, *Modelling Wildfires*, Edmonton, Alberta.
- 15 **DP**, *Three Guys Walk Into a Bar*, Edmonton, Alberta.
- 15 **Director, DP, Editor**, *MusiCycle*, Edmonton, Alberta.
- 15 **Programmer, Editor, Producer**, *Particle Drift*, Edmonton, Alberta.
- 15 **DP, Editor, Producer**, *California in Slow Motion*, California.
- 15 **DP, Editor, Producer**, *Spring Comes to Alberta*, Edmonton, Alberta.
- 14 **Photographer, DP, Editor**, *Bright Lights, Cold Water*, Toy Guns Dance Theatre, Edmonton, Alberta.
- 11 **Photographer, DP, Editor**, *Madame Butterfly*, Mercury Opera, Edmonton, Alberta.
- 06 **Actor and DP**, *various productions*, Monday Night Club, FAVA, Edmonton, Alberta.
- 02 **Actor, DP, Editor, Co-director**, *Tao of Non-Action*, Edmonton, Alberta.