

# Jonathan Rubin

## Research Interests

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Deep Neural Networks, Physiologic Time-Series Analysis, Biosignals Analysis, ECG/EEG Signal Processing, Artificial Intelligence, Machine Learning, Affective Computing, Digital Health

## Education

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| Period       | March 2009 – December 2012   |                       |
| Degree       | Doctor of Philosophy in Computer Science (PhD)   |                       |
| Thesis Title | On the Construction, Maintenance and Analysis of Case-Based Strategies in Computer Poker |                       |
| University   | The University of Auckland   | Auckland, New Zealand |

|              |   |                       |
|--------------|---|-----------------------|
| Period       | July 2006 – July 2007                                       |                       |
| Degree       | Master of Science in Computer Science (MSc)                 |                       |
| Rank         | With First Class Honours                                    |                       |
| Thesis Title | Casper: Design and Development of a Case-Based Poker Player |                       |
| University   | The University of Auckland                                  | Auckland, New Zealand |

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| Period     | July 2002 – June 2006         |                       |
| Degree     | Bachelor of Science BSc(Hons) |                       |
| Rank       | With First Class Honours      |                       |
| University | The University of Auckland    | Auckland, New Zealand |

## Work Experience

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| Period    | February 2012 – Present |                |
| Employer  | PARC, A Xerox Company   | Palo Alto, USA |
| Job Title | Research Scientist      |                |

- Developed approaches that use deep convolutional neural networks to automatically classify normal versus abnormal heart sound recordings, which achieved strong performance in Phase I of the PhysioNet/Computing in Cardiology Challenge 2016.
- Developed approaches for classifying pathologic versus non-pathologic states from physiologic time-series.
- Led development of cloud-based affective wearable system for pervasive and ubiquitous health management.
- Developed machine learning models for inferring psychological state from physiological data.

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|-----------|---|-----------------------|
| Period    | March 2004 – January 2012   |                       |
| Employer  | The University of Auckland  | Auckland, New Zealand |
| Job Title | Teaching Assistant / Lecturer   |                       |
|           | Presented lectures and tutorials for core CS and artificial intelligence classes. |                       |

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|-----------|---|-----------------------|
| Period    | October 2007 – June 2008                  |                       |
| Employer  | Orion Health                              | Auckland, New Zealand |
| Job Title | Software Engineer                         |                       |
|           | Developed healthcare software using J2EE. |                       |

## Skills

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| Expertise Areas    | Deep Neural Network Architectures, Machine Learning, Non-Linear Time-Series Analysis, Physiological Data Analysis, Non-Linear Dynamics, HRV, Anomaly Detection, Case-Based Reasoning |
| Computer Languages | Python, Matlab, R, Java  |
| Tools & Libraries  | TensorFlow, RHRV, Kubios HRV, numpy, scipy, scikit-learn, pandas, Apache Spark, WFDB, Docker   |

## Publications

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### Journal Articles

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- [1] Nolan Bard, John Alexander Hawkin, Jonathan Rubin, and Martin Zinkevich. The Annual Computer Poker Competition. *AI Magazine*, 34(2):112–, 2013.
- [2] Jonathan Rubin and Ian Watson. Case-Based Strategies in Computer Poker. *AI Communications*, 25(1):19–48, 2012.
- [3] Jonathan Rubin and Ian Watson. Computer Poker: A Review. *Artificial Intelligence*, 175(5-6):958–987, 2011.

### International Conferences

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- [4] Jonathan Rubin, Rui Abreu, Shane Ahern, Hoda Eldardiry, and Daniel G. Bobrow. Time, Frequency & Complexity Analysis for Recognizing Panic States from Physiologic Time-Series. In *Proceedings of the 10th EAI International Conference on Pervasive Computing Technologies for Healthcare, PervasiveHealth*, 2016.
- [5] Jonathan Rubin, Hoda Eldardiry, Rui Abreu, Shane Ahern, Honglu Du, Ashish Pattekar, and Daniel G. Bobrow. Towards a Mobile and Wearable System for Predicting Panic Attacks. In *Proceedings of the 2015 ACM International Joint Conference on Pervasive and Ubiquitous Computing, UbiComp 2015*, pages 529–533, 2015.
- [6] Luis Cruz, Jonathan Rubin, Rui Abreu, Shane Ahern, Hoda Eldardiry, and Daniel G. Bobrow. A Wearable and Mobile Intervention Delivery System for Individuals with Panic Disorder. In *Proceedings of the 14th International Conference on Mobile and Ubiquitous Multimedia 2015*, pages 175–182, 2015.

- [7] Jonathan Rubin and Ian Watson. Decision Generalisation from Game Logs in No Limit Texas Hold'em. In *IJCAI 2013, Proceedings of the 23rd International Joint Conference on Artificial Intelligence*, 2013.
- [8] Michael Silva, Silas McCroskey, Jonathan Rubin, Michael Youngblood, and Ashwin Ram. Learning from Demonstration to be a Good Team Member in a Role Playing Game. In *Proceedings of the Twenty-Sixth International Florida Artificial Intelligence Research Society Conference, FLAIRS 2013*, 2013.
- [9] Jonathan Rubin and Ian Watson. Opponent Type Adaptation for Case-Based Strategies in Adversarial Games. In *Case-Based Reasoning Research and Development - 20th International Conference, ICCBR 2012*, pages 357–368, 2012.
- [10] Ian Watson, Jonathan Rubin, and Glen Robertson. Sartre: A Case-Based Poker Web App. In *The 8th Australasian Conference on Interactive Entertainment, IE '12*, page 23, 2012.
- [11] Jonathan Rubin and Ian Watson. Successful Performance via Decision Generalisation in No Limit Texas Hold'em. In *Case-Based Reasoning Research and Development - 19th International Conference on Case-Based Reasoning, ICCBR 2011*, pages 467–481, 2011. ([Best Application Paper](#))
- [12] Jonathan Rubin and Ian Watson. On Combining Decisions from Multiple Expert Imitators for Performance. In *IJCAI-11, Proceedings of the Twenty-Second International Joint Conference on Artificial Intelligence*, pages 344–349, 2011.
- [13] Jonathan Rubin and Ian Watson. Similarity-Based Retrieval and Solution Re-Use Policies in the Game of Texas Hold'em. In *18th International Conference on Case-Based Reasoning*, pages 465–479. Springer-Verlag, 2010.
- [14] Jonathan Rubin and Ian Watson. A Memory-Based Approach to Two-Player Texas Hold'em. In *AI 2009: Advances in Artificial Intelligence, 22nd Australasian Joint Conference*, pages 465–474, 2009.
- [15] Ian Watson and Jonathan Rubin. Casper: A Case-Based Poker-Bot. In *AI 2008: Advances in Artificial Intelligence, 21st Australasian Joint Conference on Artificial Intelligence*, pages 594–600, 2008.
- [16] Ian Watson, Song Lee, Jonathan Rubin, and Stefan Wender. Improving a Case-Based Texas Hold'em Poker Bot. In *Proceedings of the 2008 IEEE Symposium on Computational Intelligence and Games, CIG 2009*, pages 350–356, 2008.
- [17] Jonathan Rubin and Ian Watson. Investigating the Effectiveness of Applying Case-Based Reasoning to the Game of Texas Hold'em. In *Proceedings of the Twentieth International Florida Artificial Intelligence Research Society Conference*, pages 417–422, 2007.
- [18] Jonathan Rubin, Burkhard C. Wuensche, Linda Cameron, and Carey Stevens. Animation and Modelling of Cardiac Performance for Patient Monitoring. In *20th International Conference on Image and Vision Computing New Zealand (IVCNZ 2005)*, pages 476–481, 2005.

## Workshops

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- [19] Jonathan Rubin and Ian Watson. Sartre3P: A Case-Based Multiplayer Poker Agent. In *Twenty-Sixth AAAI Conference on Artificial Intelligence, Computer Poker Symposium*, 2012.

- [20] Jonathan Rubin and Ashwin Ram. Capturing and Adapting Traces for Character Control in Computer Role Playing Games. In 20th International Conference on Case-Based Reasoning (ICCBR 2012), Workshop on TRUE: Traces for Reusing Users' Experience, 2012.
- [21] Jonathan Rubin and Ian Watson. Memory and Analogy in Game-Playing Agents. In Eighth International Conference on Case-Based Reasoning (ICCBR 2009), Workshop on Case-Based Reasoning for Computer Games, 2009.
- [22] Jonathan Rubin and Ian Watson. Sartre: System Overview: A Case-Based Agent for Two-Player Texas Hold'em. In Eighth International Conference on Case-Based Reasoning (ICCBR 2009), Workshop on Case-Based Reasoning for Computer Games, 2009.

### Theses and Dissertations

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- [23] Jonathan Rubin. On the Construction, Maintenance and Analysis of Case-Based Strategies in Computer Poker. PhD thesis, University of Auckland, 2013.
- [24] Jonathan Rubin. Casper: Design and Development of a Case-Based Poker Player. Master's thesis, University of Auckland, 2007.

### Scholarships and Awards

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|------|---|
| 2011 | Best Application Paper Award - 19th International Conference on Case-Based Reasoning    |
| 2011 | First Place at AAI Computer Poker Competition - Multi-Player, Limit Texas Hold'em Event |
| 2011 | IJCAI Travel Award  |
| 2010 | BuildIT PhD Travel Award  |
| 2009 | University of Auckland Doctoral Scholarship   |
| 2006 | Department of Computer Science. Herman Maurer Prize                                     |
| 2006 | Faculty of Science Master's Scholarship   |
| 2005 | Faculty of Science Study Award  |
| 2005 | Senior Prize in Computer Science  |
| 2004 | Faculty of Science Summer Scholarship   |

### Service

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| 2015 | PC Member for the International Conference on Case-Based Reasoning                         |
| 2014 | PC Member for the International Conference on Case-Based Reasoning                         |
| 2013 | PC Member for the International Conference on Case-Based Reasoning                         |
| 2013 | Workshops Chair for the 21st International Conference on Case-Based Reasoning              |
| 2012 | Co-chair of the TRUE Workshop at the 20th International Conference on Case-Based Reasoning |
| 2012 | Co-chair for the 2012 AAI Computer Poker Competition                                       |
| 2011 | PC Member for the ICCBR Workshop on Case-Based Reasoning for Computer Games                |
| 2011 | Co-chair for the 2011 AAI Computer Poker Competition                                       |

References available upon request.