# Curriculum Vitae

**Colin Bellinger, PhD**
Associate Professor (Sept. 2025 start)
School of Electrical Engineering and Computer Science
University of Ottawa, Ottawa, Canada
800 King Edward Ave., Ottawa, ON, K1N 6N5, Canada

**Publication Record**: +1,800 Citations, **h-index** of 21 and **i10-index** of 33


## 1. Research Summary

**Artificial Intelligence**: Machine learning, reinforcement learning, learning from few examples, class imbalance, sim2real, domain adaptation

**Applications**: AI for materials design, AI for robotic control, automation, environmental and health sciences, medical informatics and decision support, machine failure prediction, and security

**My goal as a researcher** is to advance AI research in reinforcement learning, robotics, and scientific discovery while fostering interdisciplinary collaboration and mentorship. I aim to develop robust, interpretable AI solutions for real-world embodied agents, with applications in healthcare, automation, and materials science. I aim to drive transformative research and train the next generation of researchers and computer scientists to support Canada's digital transformation and scientific innovation.

## 2. Academic Positions

**Associate Professor**, University of Ottawa, Dept. of Electrical Engineering and Computer Science (Start September 2025)

**Research Officer**, National Research Council of Canada, Digital Technologies (October 2018 – present)

**Adjunct Professor**, Dalhousie University, Faculty of Computer Science (2019 – present)

**Instructor**, Carleton University, Institute for Environmental and Interdisciplinary Science (2021-2023)

**Donald Hill Postdoctoral Fellow**, Dalhousie University, Faculty of Computer Science (2018)

**Postdoctoral Fellow**, University of Alberta (AMII), Computing Science (2016-2018)

## 3. Education

**Ph.D. in Computer Science**, University of Ottawa, 2016
Thesis: *Beyond the boundaries of smote: A framework for manifold-based synthetic oversampling*
Advisor: Nathalie Japkowicz

**M.Sc. in Computer Science** - with distinction, Carleton University, 2010
Thesis: *Modelling and classifying stochastically episodic events*
Advisor: Advisor: John Oommen

**Honours B.Sc. in Computer Science** Minor in Mathematics, Carleton University, 2006
Thesis: *Ontology Software for Semantic Web Query Answering*
Advisor: Michel Dumontier

## 4. Awards & Honours

- NRC-DT Research Excellence Award, 2025
- Best paper award: Synthetic Oversampling for Advanced Radioactive Threat Detection (ICMLA 2015)
- Best paper award: Clustering Based One-class Classification for Compliance Verification of the Comprehensive Nuclear-test-ban Treaty (CAI 2012)
- Nominated for Best Teaching Assistant Award, 2009

## 5. Research Funding & Grants

**AI for Design (Photonic)**, National Research Council of Canada (2023-2025)

- Role: Co-PI with Ross Cheriton (NRC) and Davide Spinello (University of Ottawa)
- Amount: $200,000
- Research reinforcement learning algorithms for adaptive optics in satellite communication

**AI for Design (Core)**, National Research Council of Canada (2024-2026)

- Role: Co-PI with Chris Drummond (NRC), Yunli Wang (NRC), Yang Shi (University of Victoria)
- Amount: $200,000
- Research the combination of reinforcement learning and model predictive control for robotic manipulation in chemistry labs

**AI for Design (Core)**, National Research Council of Canada (2024-2026)

- Role: Co-PI with Rupam Mahmood (University of Alberta, AMII)
- Amount: $250,000
- Research model-based reinforcement learning algorithms for robotic manipulation in chemistry labs

**AI for Design (Core)**, National Research Council of Canada (2024-2026)

- Role: Co-PI with Florian Shkurti (University of Toronto), Kourosh Darvish (Acceleration Consortium), Alan Aspuru-Guzik (University of Toronto, Acceleration Consortium)
- Amount: $200,000
- Research robotic manipulation of chemistry liquids and granular

**AI for Design (Materials)**, National Research Council of Canada (2020-2023)

- Role: Co-PI with Isaac Tamblyn (University of Ottawa), Mark Crowley (University of Waterloo)
- Amount: $200,000
- Develop digital chemistry training environment for reinforcement learning

**Workers Compensation Board of Alberta**, (2017-2018)

- Role: Collaborator with Osmar Zaiane (University of Alberta), Doug Gross (University of Alberta)
- Amount: $32,213

- Research the use of machine learning for recommending physiotherapy treatments

**Scholarships**,

- *2012-2015*: Ontario Graduate Scholarship ($45,000)
- *2013-2013*: The University of Telca, Chile Invited Researcher (4 months fully funded)
- *2012-2012*: Canada-Brazil Joint Research Initiative (6 months $10,200)
- *2010-2014*: Research Assistant, University of Ottawa ($36,000)
- *2010-2014*: Admission Scholarship, PhD program, University of Ottawa ($36,000)
- *2009-2010*: Research Assistance, Carleton University ($12,000)
- *2008-2010*: Admission scholarship, MCS program, Carleton University ($12,000)

# 6. Invited Talks & Keynote Lectures

- *Reinforcement Learning for Automated Chemistry and Materials Discovery*, Acceleration Consortium, (2024)
- *Class Imbalance in Deep Learning: Impacts and solutions*, University of Ottawa CSI5155, (2024)
- *On AI for Design*, Ingenium Hackathon, (2023)
- *Class Imbalance in Deep Learning: Impacts and solutions*, Trinity College Dublin, (2023)
- *Intro to Bandits*, NRC Tech Talks, (2022)
- *Intro to Reinforcement Learning I*, NRC Tech Talks, (2022)
- *Intro to Reinforcement Learning II*, NRC Tech Talks, (2022)
- *Class Imbalance in Deep Learning: Impacts and solutions*, University of Ottawa CSI5155, (2022)
- *Class Imbalance in Deep Learning: Impacts and solutions*, University of Ottawa CSI5155, (2019)
- *Active Learning in AI for Design*, NRC Talk Series, (2019)
- *Learning for the future: A Case Study on Reproducibility in Applied Data Science*, The 36th Annual Quality and Productivity Research Conference, Workshop on Applied Data Mining, (2019)
- *Workshop on Epidemiological Hypothesis Generation with the VizAR Software*, (lecturer and tutorial instructor), Carleton University, (2018)
- *Big Data Analytics*, University of Alberta CMPUT690, (2017)
- *Managing Adversity: Insights and Algorithms for Complex Data Domains*, University of Alberta AI Seminar, (2016)
- *Machine Learning*, University of Ottawa CSI4145, (2015)
- *Concept Learning Systems/Machine Learning*, University of Ottawa, CSI5387, (2015)
- *Anomaly Detection in Gamma Ray Spectra: A Machine Learning Perspective*, University of Ottawa, Canada, The Text Analysis and Machine Learning Group, (2014)
- *Synthetic Oversampling with Autoecoders*, Universidad de Talca, Chile, (2013)
- *Introduction to Computing II*, University of Ottawa ITI1121, (2013)

# 7. Teaching Experience

## Contract Instructor

**ISAP3001: Principles and Applications in Data Analysis**, Carleton University (2021-2023)

- Mean **Student Experience Questionnaire Score 4.3 out of 5**
- Design and develop a project-based data analytics and data science course
- Teach, mentor, and inspire students

## TA / Lab Instructor

**ITI1120: Intro to Computing I**, University of Ottawa (2011, 2014, 2015)

- Lead labs introducing principles of software design and engineering (Python)

**ITI1121: Intro to Computing II**, [University of Ottawa (2013-2015)

- Lead labs introducing key concepts in object-oriented programming (Python)

**SEG3102: Software Design and Architecture**, University of Ottawa (2010)

- Lead labs introducing principles of software design and engineering (Python)

**COMP1405: Intro to Computer Science II**, Carleton University (2009-2010)

- Nominated for **TA of the year at Carleton**
- Lead labs introducing key concepts in object-oriented programming (Java)

**COMP1406: Intro to Computer Science II**, Carleton University (2009-2010)

- Lead labs on designing and implementing computer applications (Java)

**Programming Tutor**, University of Ottawa (2010-2014)

- Privately tutor students in Java and Python programming

**Programming Tutor**, Carleton University (2010-2010)

- Privately tutor students in Java programming and object-oriented design

**Computer Science Peer Counselor**, Carleton University (2006)

- Mentor and guide computer science students struggling with coursework and adapting to university life

# 8. Supervision & Mentorship

## Postdoctoral Fellow

- AN, NRC PDF, Continual Reinforcement Learning for Adaptive Optics (2024 - Current)

## Ph.D. Students

- GV, NRC-University of Alberta, Continual Reinforcement Learning Robots (2024 - Current)
- PP, NRC-University of Ottawa, Regularizing On-Policy Reinforcement Learning for Smoother Action Policies (2023 - Current)
- TL, NRC-University of Victoria, Model-Predictive Control Robotic Manipulation (2024 - Current)
- DD, NRC-University of Notre Dame, Linear Data Augmentation to Improve Generalization for Imbalanced Learning (2022 - 2024)
- SGS, NRC-University of Waterloo, Reinforcement Learning Materials Synthesis (2020 - 2023)
- CB, NRC-University of Ottawa, ChemGymRL Environment for Learning Digital Chemistry (2020 - 2023)

### M.Sc. Students

- KW, NRC-University of Ottawa, Active Learning for Computational Nanophotonics (2024 - Current)
- FS, NRC-University of Alberta, Efficiently Utilization of Pre-trained Models in Reinforcement Learning Robotics (2024 - Current)
- AA, NRC-University of Alberta, Safe Sim2Real with Model-Based Reinforcement Learning (2024 - Current)
- YS, NRC-University of Victoria, Model Predictive Path Integral Reinforcement Learning Robots (2024 - Current)
- RZ, NRC-University of Ottawa, Reinforcement Learning Application in Wavefront Sensorless Adaptive Optics System (2023 - 2024)
- PY, University of Alberta, Explainable Machine Learning for Health application (2017 - 2018)
- FA, University of Alberta, Advantage of Integration in Big Data: Feature Generation in Multi-Relational Databases for Imbalanced Learning, (2015 - 2016)

### Interns and Visiting Students

- CW, NRC, Reinforcement Learning Chemist (2024 - Current)
- HH, NRC-University of Alberta, Sample-Efficient Adaptation with Model-Based Reinforcement Learning (2024 - Current)
- SA, NRC-University of Toronto, Benchmarking the Manipulation of Non-rigid Objects (2025 - Current)
- JH, NRC, LLM for Reasoning and Decision Making, (2024 - 2024)
- EC, NRC, LLM for Reasoning and Decision Making, (2024 - 2024)
- JGM, NRC-University of Southern Denmark, Data Complexity in Imbalance Learning (2023- 2023)
- KS, NRC-University of Waterloo, Benchmarking Materials Synthesis Reinforcement Learning Agents (2023 - 2023)
- LLC, NRC, Reinforcement Learning-Based Reaching and Tracking Robotic Arms (2022 - 2023)

## 9. Service & Leadership

### Program Chair

- *2022*: SIGKDD Conference on Knowledge Discovery and Data Mining (KDD) Workshop on Deep Learning Practice and Theory for High-Dimensional, Sparse, and Imbalanced Data
- *2021*: International Conference on Learning Representations (ICLR) Workshop on From Shallow to Deep, Overcoming Limited and Adverse Data
- *2019*: 32th Canadian Conference on Artificial Intelligence Graduate Student Symposium (GSS)
- *2016 – 2018*: University of Alberta, Weekly AI Seminars
- *2018*: Carleton University, Canada, Workshop on Epidemiological Hypothesis Generation with the VizAR Software
- *2017*: 30th Canadian Conference on Artificial Intelligence Graduate Student Symposium (GSS)

## Program Committees

- *2025*: International Joint Conference on AI (IJCAI)
- *2025*: Canadian Conference on Artificial Intelligence (AI)
- *2024*: SIGKDD Conference on Knowledge Discovery and Data Mining (KDD)
- *2024*: International Joint Conference on AI (IJCAI)
- *2024*: Discovery Science (DS)
- *2023*: NeurIPS Workshop on Advancing Neural Network Training (WANT)
- *2023*: Conference on Computer Science and Intelligence Systems (FedCSIS)
- *2023*: SIGKDD Conference on Knowledge Discovery and Data Mining (KDD)
- *2023*: International Joint Conference on AI (IJCAI)
- *2023*: Discovery Science (DS)
- *2023*: Conference on Computer Science and Intelligence Systems (FedCSIS)
- *2021*: SIGKDD Conference on Knowledge Discovery and Data Mining (KDD)
- *2022*: SIGKDD Conference on Knowledge Discovery and Data Mining (KDD)
- *2022*: International Joint Conference on AI (IJCAI)
- *2022*: Discovery Science (DS)
- *2022*: Workshop on Learning with Imbalanced Domains: Theory and Applications (LIDTA)
- *2021*: Conference on Neural Information Processing Systems (NeurIPS)
- *2021*: SIGKDD Conference on Knowledge Discovery and Data Mining (KDD)
- *2021*: SIAM International Conference on Data Mining (SDM)
- *2021*: European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML-PKDD)
- *2021*: Discovery Science (DS)
- *2021*: International Joint Conference on AI (IJCAI)
- *2021*: The Association for the Advancement of Artificial Intelligence (AAAI)
- *2020*: International Joint Conference on AI (IJCAI )
- *2020*: Canadian Conference on Artificial Intelligence (AI)
- *2019*: Canadian Conference on Artificial Intelligence (AI)
- *2018*: Canadian Conference on Artificial Intelligence (AI)
- *2018*: Cost-Sensitive Learning Workshop (co-located with SDM)
- *2018*: International Symposium on Methodologies for Intelligent Systems (ISMIS)
- *2018*: Workshop on Learning with Imbalanced Domains: Theory and Applications (LIDTA)
- *2018*: Association for the Advancement of Artificial Intelligence (AAAI)
- *2018*: International Joint Conference on Artificial Intelligence (IJCAI)
- *2017*: Conference on Neural Information Processing Systems (NeurIPS)
- *2017*: Association for the Advancement of Artificial Intelligence (AAAI)

- *2017*: Canadian Conference on Advances in Artificial Intelligence (CAI)
- *2017*: Data Mining for Cyber Security (co-located with IEEE ICDM 2017)
- *2017*: Workshop on Learning with Imbalanced Domains: Theory and Applications (LIDTA)
- *2016*: IEEE Symposium on Computational Intelligence for Security and Defense Applications (CISDA)
- *2015*: Discovery Science (DS)

### Refereeing

*Grants*:

- *2024*: Canadian Foundation for Innovation, Canada
- *2023*: Israel Science Foundation (ISF), Israel
- *2022*: Israel Science Foundation (ISF), Israel
- *2021*: NRC AI for Logistics, Canada
- *2019*: NSERC College and Community Innovation – Innovation Enhancement Grant, Canada
- *2019*: National Fund for Scientific and Technological Development (FONDECYT), Chile
- *2018*: National Fund for Scientific and Technological Development (FONDECYT), Chile

*Journals*:

BMC Medical Informatics and Decision Making, Communications Earth and Environment, Digital Discovery, Expert Systems with Applications, Environmental Health, Environmental Research, Environmental Science and Technologies, Journal of Machine Learning Research, Health and Technology, Information Sciences, IEEE Transactions on Neural Networks and Learning Systems, IEEE Intelligent Systems, Machine Learning Journal, Neurocomputing, Pattern Recognition Letters, Transactions on Knowledge and Data Engineering, IEEE Transactions on Neural Networks and Learning Systems, IEEE Transactions on Pattern Analysis and Machine Intelligence

### Other Contributions:

- *2023*: Ingenium Innovation Challenge, Climate Hackathon – Judge
- *2020*: AI XPRIZE For Social Good – Neutral Observer of Deep Drug, Baton Rouge, United States
- *2019*: AI XPRIZE For Social Good – Neutral Observer of Aifred Health, Montreal, Canada
- *2019*: AI XPRIZE For Social Good – Red Judge
- *2019*: GovLab 100 Questions Initiative on Air Quality – Contributor

## 10. Publications

I have co-authored over 75 research articles with approximately 1,700 citations in total. These numbers are growing quickly each year. At the start of 2025, my publications have an h-index of 20 and an i10 index of 32. I have many publications in A* conferences, such as NeurIPS (Neural Information Processing Systems), IEEE ICDM (International Conference on Data Mining), and ICDE (International Conference on Data Engineering), and high-impact international journals, such as *Environment International* (IF=10.3) *Expert Systems with Application* (IF=7.5), *Machine Learning* (IF=5.8) and *Digital Discovery* (IF=5.65).

In the list below, papers marked with [1] have over 100 citations, those marked with [2] have over 50 citations.

[1] This paper has over 100 citations
[2] This paper has over 50 citations

## Peer-Reviewed Journal Articles

21. [2] Ghosh, K. **Bellinger, C**. Corizzo, R. Branco, P. Krawczyk, B. Japkowicz, N. "The class imbalance problem in deep learning". *Machine Learning*. 2024

20. [2] Dablain, D[3]., Jacobson, K.N., **Bellinger, C.**, Roberts, M., Chawla, N.V. "Understanding CNN fragility when learning with imbalanced data". *Machine Learning*. 2024

19. Parvizi, P[3]., Zou, R., **Bellinger, C.**, Cheriton, R., Spinello, D. "Reinforcement Learning Environment for Wavefront Sensorless Adaptive Optics in Single-Mode Fiber Coupled Optical Satellite Communications Downlinks". *Photonics*. 2023

18. Lourenço, M.P., Hostaš, J., **Bellinger, C.**, Tchagang, A., Salahub, D.R. "Reinforcement learning for in silico determination of adsorbate—substrate structures". *Journal of Computational Chemistry*. 2024

17. Dablain, D[3]., **Bellinger, C.**, Krawczyk, B., Aha, D.W., Chawla, N. "Understanding imbalanced data: XAI & interpretable ML framework". *Machine Learning*. 2024

16. Beeler, C[3]., Subramanian, S.G., Sprague, K., Baula, M., Chatti, N., Dawit, A., Li, X., Paquin, N., Shahen, M., Yang, Z., **Bellinger, C.**, Crowley, M., Tamblyn, I. "ChemGymRL: A customizable interactive framework for reinforcement learning for digital chemistry". *Digital Discovery*. 2024

15. Cerqueira, V., Torgo, L., Branco, P., **Bellinger, C.**. "Automated imbalanced classification via layered learning". *Machine Learning*. 2023

14. [1] Kulik, H.J., et al., **Bellinger, C.**, Ghiringhelli, L.M. Roadmap on machine learning in electronic structure". *Electronic Structure*. 2022

13. Koziarski, M., **Bellinger, C.**, Woźniak, M. "RB-CCR: radial-based combined cleaning and resampling algorithm for imbalanced data classification". *Machine Learning*. 2021

12. Gross, D.P., Steenstra, I.A., Harrell Jr, F.E., **Bellinger, C.**, Zaïane, O. "Machine learning for work disability prevention: introduction to the special series". *Journal of Occupational Rehabilitation*. 2020

11. Gross, D.P., Steenstra, I.A., Shaw, W., Yousefi, P., **Bellinger, C.**, Zaïane, O. Validity of the Work Assessment Triage Tool for Selecting Rehabilitation Interventions for Workers' Compensation Claimants with Musculoskeletal Conditions". *Journal of Occupational Rehabilitation*. 2020

10. [2] Tarawneh, A.S., Hassanat, A.B., Almohammadi, K., Chetverikov, D., **Bellinger, C**. Smotefuna: Synthetic minority over-sampling technique based on furthest neighbour algorithm". *IEEE Access*. 2020

9. [2] **Bellinger, C**., Sharma, S., Japkowicz, N., Zaïane, O., "Framework for Extreme Imbalance Classification - SWIM: Sampling WIth the Majority Class." *Knowledge and Information Systems (KAIS)*. 2019

8. Serrano-Lomelin, J., et al., **Bellinger, C**. Interdisciplinary-driven hypotheses on spatial associations of mixtures of industrial air pollutants with adverse birth outcomes." *Environmental International*. 2019

7. Vu, K., Clark, R., **Bellinger, C**., Erickson, G., Zaiane, O., Osornio-Vargas, A., Yuan, Y., "Lift and its Relationship to Relative Risk and Odds Ratio - Bridging the Terminology Gap Between Data Mining and Health Research" Submitted to *BMC Public Health*. 2019

6. Aldana, D., Salgueiro, Y., **Bellinger, C**., Rivera, M., Astudillo, C., "Data for resistance and inductance estimation within a voltage source inverter." *Data in Brief*. 2019

[3]Student Led paper

5. **Bellinger, C.**, Sharma, S., Japkowicz, N., "One-Class Classification - From Theory to Practice: A case-study in radioactive threat detection." *Expert Systems with Applications.* 2018

4. [1] **Bellinger, C.**, Jabbar, M.S.M., Zaïane, O., Osornio-Vargas, A., "A Systematic Review of Data Mining and Machine Learning for Air Pollution Epidemiology." *BMC Public Health.* 2017

3. Jabbar, M.S.M., **Bellinger, C.**, and Zaiane, O., Osornio-Vargas, A., "Discovering Co-location Patterns with Aggregated Spatial Transactions and Dependency Rules." *International Journal of Data Science and Analytics.* 2017

2. [2] **Bellinger, C.** and Drummond, C. and Japkowicz, N., "Manifold-Based Synthetic Oversampling with Manifold Conformance Estimation." *Machine Learning.* 2017

1. **Bellinger, C.**, and Oommen, B. J., "On the Pattern Recognition and Classification of Stochastically Episodic Events." *Transactions on Computational Collective Intelligence VI*, vol. 6, 2012

## Conference Proceedings

27. Fettes, E[3]., Madoery, P.G., Yanikomeroglu, H., Karabulut-Kurt, G., Naik, A., **Bellinger, C.**, Martel, S., Ahmed, K., Siddiqui, S. "Energy-Efficient Satellite IoT Optical Downlinks Using Weather-Adaptive Reinforcement Learning." In *IEEE International Conference on Communications (ICC)*, 2025.

26. Vasan, G[3]., Elsayed, M., Azimi, S.A., He, J., Shahriar, F., **Bellinger, C.**, White, M., Mahmood, A.R. "Deep Policy Gradient Methods Without Batch Updates, Target Networks, or Replay Buffers." In *Thirty-eighth Conference on Neural Information Processing Systems (NeurIPS)*, 2024.

25. Beeler, C[3]., Li, X., **Bellinger, C.**, Crowley, M., Fraser, M., Tamblyn, I. "Dynamic programming with incomplete information to overcome navigational uncertainty in POMDPs." In *Proceedings of the 37th Canadian Conference on Artificial Intelligence (CCAI)*, 2024.

24. Létourneau, V., **Bellinger, C.**, Tamblyn, I., Fraser, M. "Time and temporal abstraction in continual learning: Tradeoffs, analogies, and regret in an active measuring setting." In *Conference on Lifelong Learning Agents (CoLLAs)*, 2023.

23. Dablain, D[3]., **Bellinger, C.**, Krawczyk, B., Chawla, N.V. "Efficient augmentation for imbalanced deep learning." In *IEEE 39th International Conference on Data Engineering (ICDE)*, 2023.

22. Gøttcke, J.M[3]., **Bellinger, C.**, Branco, P., Zimek, A. "An interpretable measure of dataset complexity for imbalanced classification problems." In *SIAM International Conference on Data Mining (SDM)*, 2023.

21. Ding, L., Corizzo, R., **Bellinger, C.**, Ching, N., Login, S., Yepez-Lopez, R., Gong, J., Wu, D.L. "Imbalanced multi-layer cloud classification with Advanced Baseline Imager (ABI) and CloudSat/CALIPSO data." In *IEEE International Conference on Big Data*, 2022.

20. Ghosh, K., **Bellinger, C.**, Corizzo, R., Krawczyk, B., Japkowicz, N. "On the combined effect of class imbalance and concept complexity in deep learning." In *IEEE International Conference on Big Data*, 2021.

19. Corizzo, R., Dauphin, Y., **Bellinger, C.**, Zdravevski, E., Japkowicz, N. "Explainable image analysis for decision support in medical healthcare." In *IEEE International Conference on Big Data*, 2021.

18. Krawczyk, B., **Bellinger, C.**, Corizzo, R., Japkowicz, N. "Undersampling with support vectors for multi-class imbalanced data classification." In *International Joint Conference on Neural Networks (IJCNN)*, 2021.

17. **Bellinger, C.**, Coles, R., Crowley, M., Tamblyn, I. "Active Measure Reinforcement Learning for Observation Cost Minimization." In *Proceedings of the 34th Canadian Conference on Artificial Intelligence (CCAI)*, 2021.

16. **Bellinger, C.**, Corizzo, R., Japkowicz, N. "Calibrated resampling for imbalanced and long-tails in deep learning." In *Discovery Science: 24th International Conference (DS)*, 2021.

15. **Bellinger, C.**, Branco, P., Torgo, L. "The CURE for Class Imbalance." In *Proceedings of the 22nd International Conference on Discovery Science (DS)*, 2019.

14. [1] Sharma, S., **Bellinger, C.**, Krawczyk, B., Japkowicz, N., Zaïane, O. "Synthetic oversampling with the majority class: A new perspective on handling extreme imbalance." In *IEEE International Conference on Data Mining (ICDM)*, 2018.

13. Aldana, D., Salgueiro, Y., **Bellinger, C.**, Rivera, M., Astudillo, C. "Performance Assessment of Classification Methods for the Inductance within a VSI." In *IEEE International Conference on Automation*, 2018.

12. Ahmed, F., Samorani, M., **Bellinger, C.**, Zaïane, O. "Advantage of integration in big data: Feature generation in multi-relational databases for imbalanced learning." In *IEEE International Conference on Big Data*, 2016.

11. **Bellinger, C.**, Drummond, C., Japkowicz, N. "Beyond the Boundaries of SMOTE: Manifold-Based Synthetic Oversampling." In *Machine Learning and Knowledge Discovery in Databases: European Conference (ECML-PKDD)*, 2016.

10. Barnabé-Lortie, V., **Bellinger, C.**, Japkowicz, N. "Active Learning for One-Class Classification." In *IEEE International Conference on Machine Learning and Applications (ICMLA)*, 2015.

9. **Bellinger, C.**, Amid, A., Japkowicz, N., Victor, H. "Multi-label Classification of Anemia Patients." In *IEEE International Conference on Machine Learning and Applications (ICMLA)*, 2015.

8. **Bellinger, C.**, Japkowicz, N., Drummond, C. "Synthetic Oversampling for Advanced Radioactive Threat Detection." In *IEEE International Conference on Machine Learning and Applications (ICMLA)*, 2015. **Best Paper Award**.

7. Barnabé-Lortie, V., **Bellinger, C.**, Japkowicz, N. "Smoothing Gamma Ray Spectra to Improve Outlier Detection." In *IEEE Symposium on Computational Intelligence for Security and Defense Applications (CISDA)*, 2014.

6. [1] **Bellinger, C.**, Sharma, S., Japkowicz, N. "One-Class versus Binary Classification: Which and When?" In *IEEE International Conference on Machine Learning and Applications (ICMLA)*, 2012.

5. [2] Sharma, S., **Bellinger, C.**, Japkowicz, N., Berg, R., Ungar, K. "Anomaly detection in gamma-ray spectra: A machine learning perspective." In *IEEE Symposium on Computational Intelligence for Security and Defence Applications (CISDA)*, 2012.

4. Sharma, S., **Bellinger, C.**, Japkowicz, N. "Clustering-Based One-Class Classification for Compliance Verification of the Comprehensive Nuclear-Test-Ban Treaty." In *Canadian Conference on Artificial Intelligence (CCAI)*, 2012. **Best Paper Award**.

3. **Bellinger, C.**, Japkowicz, N. "Motivating the inclusion of meteorological indicators in the CTBT feature-space." In *IEEE Symposium on Computational Intelligence for Security and Defense Applications (CISDA)*, 2011.

2. **Bellinger, C.**, Oommen, B.J. "A new frontier in novelty detection: Pattern recognition of stochastically episodic events." In *Asian Conference on Intelligent Information and Database Systems (ACIIDS)*, 2011.

1. **Bellinger, C.**, Oommen, B.J. "On Simulating Episodic Events Against a Background of Noise-like Non-episodic Events." In *Summer Computer Simulation Conference (SCSC)*, 2010.

## Book Chapters

2. **Bellinger, C**, Jabbar MS, Wine O, Nielsen C, Serrano-Lomelin J, Osornio-Vargas A, Zaïane OR. "AI Applied to Air Pollution and Environmental Health: A Case Study on Hypothesis Generation." In *Humanity Driven AI: Productivity, Well-being, Sustainability and Partnership.* (Chen, F and Zhou, J ed.), Springer, Cham. pp. 195–222, 2022.

1. Oommen, B. J., and **Bellinger, C**., "Emerging Trends in Machine Learning: Classification of Stochastically Episodic Events." In *Emerging Paradigms in Machine Learning* (Ramanna, S. and Jain, L. C. AND Howlett, R. J., ed.), Springer Berlin Heidelberg, pp. 161–195, 2013.

## Conference Abstracts

4. Coles $^{3}$v, **Bellinger, C** Tamblyn I. "Reinforcement Learning and the Cost of Observation." In *Bulletin of the American Physical Society*, 2020.

3. Gross, D.P., Steenstra, A.I., Shaw, W.S., Yousefi, P., **Bellinger, C.**, Zaïane, O. "Validation of the Work Assessment Triage Tool for Selecting Rehabilitation Interventions for Injured Workers." *Work Disability Prevention and Integration Conference*, 2018.

2. Nielsen, C., Serrano Lomelin, J., Jabbar, M.S.M., Wine, O., Zaïane, O., Osornio Vargas, A.R., **Bellinger, C**., and the DoMiNo Team. "An Integrative and Collaborative Approach to Associating Adverse Birth Outcomes and Industrial Air Pollution." *Canadian National Perinatal Research Meeting*, 2018.

1. **Bellinger, C**., Jabbar, M.S.M., Hojjati, S., Zaïane, O., Osornio Vargas, A.R., and the DoMiNo Team. "VizAR: A Software Tool for Epidemiological Hypothesis Generation with Geo-Spatial Data Mining." *Canadian National Perinatal Research Meeting*, 2018.

## Articles in Refereed Workshops

9. Wang, C$^{3}$., Shahriar, F., Azimi, A. S., Vasan, G., Mahmood, R. A., **Bellinger, C.** (2024). Versatile and Generalizable Manipulation via Goal-Conditioned Reinforcement Learning with Grounded Object Detection. In *Proceedings of the Conference on Robot Learning, Workshop on Mastering Robot Manipulation in a World of Abundant Data.*

8. Beeler, C$^{3}$., Subramanian, S. G., Sprague, K., **Bellinger, C.**, Crowley, M., Tamblyn, I. (2023). Demonstrating ChemGymRL: An Interactive Framework for Reinforcement Learning for Digital Chemistry. In *Proceedings of the NeurIPS Workshop on AI4Mat.*

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# 11. Training

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- *Pedagogy and Course Design–Deepening Understanding*, University of Alberta, Graduate Teaching and Learning, May 2017 – June 2017
- *Beginner Spanish*, Conversa Language School, September 2012 – April 2012