Rex Chen

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Education

CARNEGIE MELLON UNIVERSITY **Aug 2020 – Present**
School of Computer Science Advisors: Fei Fang,
PhD in Societal Computing (Year 4; GPA: 4.23/4.33) Norman Sadeh

UNIVERSITY OF BRITISH COLUMBIA **Sep 2015 – May 2020**
Department of Computer Science Advisor: Kevin Leyton-Brown
Honours BSc in Computer Science (Average: 92.9%)

Refereed Conference Papers

* Equal contribution

[1] Chris Cameron, Jason Hartford, Taylor Lundy, Tuan Truong, Alan Milligan, **Rex Chen**, & Kevin Leyton-Brown (2024) "UNSAT Solver Synthesis via Monte Carlo Forest Search". *Proceedings of the 21st International Conference on the Integration of Constraint Programming, Artificial Intelligence, and Operations Research* (CPAIOR '24), Part I, pp. 170–189.

[2] Yuanyuan Feng, Abhilasha Ravichander, Yaxing Yao, Shikun Zhang, **Rex Chen**, Shomir Wilson, & Norman Sadeh (2024) "Understanding How to Inform Blind and Low-Vision Users about Data Privacy through Privacy Question Answering Assistants". *Proceedings of the 33rd USENIX Security Symposium* (USENIX Security '24), pp. 1–18.

[3] **Rex Chen**, Kathleen M. Carley, Fei Fang, & Norman Sadeh (2023) "Purpose in the Machine: Do Traffic Simulators Produce Distributionally Equivalent Outcomes for Reinforcement Learning Applications?". *Proceedings of the 2023 Winter Simulation Conference* (WSC '23), pp. 1–12.

[4] **Rex Chen**, Fei Fang, & Norman Sadeh (2022) "The Real Deal: A Review of Challenges and Opportunities in Moving Reinforcement Learning-Based Traffic Signal Control Systems Towards Reality". *12th International Workshop on Agents in Traffic and Transportation* (ATT '22 @ IJCAI '22), *CEUR Workshop Proceedings* **3173**: 14–31.

[5] Peter Story, Daniel Smullen, **Rex Chen**, Yaxing Yao, Alessandro Acquisti, Lorrie Faith Cranor, Norman Sadeh, & Florian Schaub (2022) "Increasing Adoption of Tor Browser Using Informational and Planning Nudges". *Proceedings on Privacy-Enhancing Technologies* (PoPETS) **2022.2**, pp. 1–32.

[6] Siddhant Arora, Henry Hosseini, Christine Utz, Vinayshekhar Bannihatti Kumar, Tristan Dhellemmes, Abhilasha Ravichander, Peter Story, Jasmine Mangat, **Rex Chen**, Martin Degeling, Tom Norton, Thomas Hupperich, Shomir Wilson, & Norman Sadeh (2022) "A Tale of Two Regulatory Regimes: Creation and Analysis of a Bilingual Privacy Policy Corpus". *Proceedings of the 13th International Conference on Language Resources and Evaluation* (LREC '22), paper 443, pp. 1–13.

[7] **Rex Chen**, Fei Fang, & Norman Sadeh (2021) "Deep Gaussian Processes for Preference Learning". *Workshop on Human and Machine Decisions at NeurIPS 2021* (WHMD '21 @ NeurIPS '21), pp. 1–12.

[8] **Rex Chen**, Fei Fang, Aleecia M. McDonald, Thomas Norton, & Norman Sadeh (2021) "Fighting the Fog: Evaluating the Clarity of Privacy Disclosures in the Age of CCPA". *Proceedings of the 20th Workshop on Privacy in the Electronic Society* (WPES '21), pp. 73–102.

[9] Chris Cameron*, **Rex Chen***, Jason Hartford*, & Kevin Leyton-Brown (2020) "Predicting Propositional Satisfiability via End-to-End Learning". *Proceedings of the 2020 AAAI Conference on Artificial Intelligence* (AAAI '20), **34**(4): 3324–3331.

[10] Chris Cameron*, **Rex Chen***, Jason Hartford*, & Kevin Leyton-Brown (2019) "Predicting Propositional Satisfiability via End-to-End Learning". *NeurIPS 2019 Graph Representation Learning Workshop* (GRL '19 @ NeurIPS '19), pp. 1–15.

Refereed Journal Papers

[11] **R. H.-G. Chen**, C.-C. Chen, & C.-M. Chen (2019) "Unsupervised cluster analyses of character networks in fiction: Community structure and centrality". *Knowledge-Based Systems* **163**: 800–810.

[12] **R. H.-G. Chen** & C.-M. Chen (2016) "Visualizing the World's Scientific Publications". *Journal of the Association for Information Science and Technology*. **67**(10): 2477–2488.

Submissions Under Review

[13] **Rex Chen**, Ruiyi Wang, Fei Fang, & Norman Sadeh (2024) "Missing Pieces: How Framing Uncertainty Impacts Longitudinal Trust in AI Decision Aids – A Gig Driver Case Study".

Invited Talks

[14] "**Multi-Agent Reinforcement Learning for Applications in Transportation**". University of Pittsburgh, CS3710: AI for Social Good (Spring 2024; instructor: Ryan Shi): guest lecture.

[15] "**Fighting the Fog: Evaluating the Clarity of Privacy Disclosures in the Age of CCPA**". CyLab Partners Conference (2021; online): oral presentation and lab tour.

[16] "**Explore Usable Privacy: An Website Privacy Policy Dataset Incorporating Human and Machine Annotation**". CyLab Partners Conference (2020; online): poster and oral presentation.

Skills

- **Languages/Frameworks:** Python (PyTorch, TensorFlow, Django, Flask), R, SQL (Hive, Spark, PostgreSQL, MySQL), C#, Docker, HTML, CSS, JavaScript, Bash, PowerShell, C++, Java, MATLAB
- **Knowledge Areas:** Reinforcement learning, transportation research, interpretable machine learning, human-computer interaction, statistical modelling, causal inference, computational game theory

Industrial Work Experience

DATA SCIENTIST INTERN

Lyft **May 2024 – Aug 2024**

- Designed, trained, and productionised ensemble machine learning models to predict the responses of gig drivers to real-time incentive mechanisms across multiple markets.
- Applied causal inference methods to derive actionable insights for setting incentive policies, including a proposed feature envisioned in collaboration with multiple cross-functional teams.

SOFTWARE DEVELOPER CO-OP

Change Healthcare **Sep 2017 – Apr 2018**

- Worked with senior software developers to code, test, and deploy bug fixes and upgrades for two leading healthcare workflow products.
- Took on a primary role in researching, developing, and integrating an authentication service for inter-service communications, including a custom logging mechanism, using an open-source library in the .NET Core framework.

Academic Work Experience

PHD CANDIDATE

Software & Societal Systems Department, Carnegie Mellon University **Aug 2020 – Present**

- Researching applications of multi-agent reinforcement learning, human-computer interaction, and computational game theory to problems in transportation, including traffic signal control and ridesharing.
- Focusing on designing multi-agent systems for deployment in real-world contexts marked by uncertainty.
- Led collaborative research projects involving three undergraduate and five master's students, entailing various research methods such as machine learning experiments, user studies, and literature reviews.
- Supported by an NSERC PGS D, a Mobility21 grant, and the Tang Family Endowed Innovation Fund.
- **Submissions**: [2, 3, 4, 5, 6, 7, 8, 13]; **Talks**: [14, 15, 16]

TEACHING ASSISTANT

Software & Societal Systems Department, Carnegie Mellon University **Aug 2021 – Apr 2022**

- **17-737/Executive Education** "Artificial Intelligence Methods for Social Good" (Fei Fang): Assisted with lectures, designed homework assignments, and co-advised course projects.
- **17-331/17-631** "Information Security, Privacy, and Policy" (Norman Sadeh): Assisted with lectures, co-advised course projects, and designed assessments. Guest lecture: "Usable Security and Privacy" (October 12, 2021).

TEACHING ASSISTANT

Department of Computer Science, University of British Columbia **Jul 2019 – Aug 2019**

- **CPSC 213** "Introduction to Computer Systems": Assisted with lectures and laboratories.

RESEARCH ASSISTANT

Department of Computer Science, University of British Columbia **May 2018 – Jun 2020**

- Trained graph neural networks end-to-end to predict propositional satisfiability with high accuracy and scalability on a challenging distribution, outperforming state-of-the-art hand-engineered features.
- Formalised conditions under which end-to-end neural network training can improve downstream optimisation performance, based on experiments with stochastic graph optimisation problems.
- Supported by Canadian NSERC Undergraduate Student Research Awards (2018, 2019).
- **Submissions**: [1, 9, 10]

TEACHING ASSISTANT

Department of Computer Science, University of British Columbia **Jul 2017 – Aug 2017**

- **CPSC 213** "Introduction to Computer Systems" (Anthony Estey): Assisted with lectures and laboratories.

TEACHING ASSISTANT

Department of Computer Science, University of British Columbia **Jan 2017 – Apr 2017**

- **CPSC 121** "Models of Computation" (Steve Wolfman): Assisted with lectures and laboratories.

INDEPENDENT RESEARCH **Jun 2014 – Jan 2019**

- Used natural language processing, network statistics, graph theory to analyse static and dynamic properties of social networks formed by associations between characters in literary fiction.
- Applied text-mining, classification, and clustering algorithms to analyse and visualise global scientific development through scientific journal publications over the span of 18 years.
- **Submissions**: [11, 12]

Activities

- 2024: **Program Committee Member** for AAAI 2025 Demo Track
- 2022: **Volunteer** for IJCAI 2022
- 2022: **Co-organiser** and **Moderator** for the *2022 CMU K-12 Summit on AI for Social Good*
- 2021: **Co-organiser** and **Moderator** for the *2021 CMU AI and Social Good Symposium*
- 2021: **Reviewer** for the *Workshop on Human and Machine Decisions at NeurIPS 2021* (WHMD '21)
- 2019 – Present: **Maintainer** of the **Combinatorial Auction Test Suite**, a standard benchmark generator in auction research created by Kevin Leyton-Brown (https://github.com/kevinlb1/CATS)
- 2016: **Reviewer** for *Scientometrics* (proof)

Awards & Honours

- 2023: **Presidential Graduate Fellowship**, awarded by the CMU School of Computer Science
- 2023: **NSERC Postgraduate Scholarship – Doctoral** for proposal "Large Scale Learning for Multi-Agent Communication & Coordination in Transportation"
  (Highly-ranked applicant, offered a Canadian Graduate Scholarship - Doctoral)
- 2022: **NSF Graduate Research Fellowship – Honourable Mention** for proposal "Large Scale Learning for Multi-Agent Communication & Coordination in Transportation"
- 2022: **Mobility21** (USDOT/CMU National University Transportation Centre) funding for proposal "Alleviating Traffic Congestion: Developing and Evaluating Novel Multi-Agent Reinforcement Learning Traffic Light Coordination Techniques" (PI: Fei Fang; Co-PI: Norman Sadeh)
- 2021: **Tang Family Endowed Innovation Fund** for proposal "Large Scale Learning for Multi-Agent Communication & Coordination in Transportation" (PI: Fei Fang)
- 2018, 2019: **NSERC Undergraduate Student Research Awards**
- 2016, 2017, 2019: **UBC Science Scholar & Dean's Honour List**
- 2016, 2017: **Microsoft Tuition Scholarship**
- 2016, 2018, 2019: **Trek Excellence Scholarship**
- 2016: **J. Fred Muir Memorial Scholarship in Science**