Xiang Dai

Research scientist at
CSIRO

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Summary

I am a research scientist (in Natural Language Processing) at CSIRO, Australia's national science agency.

My earlier work focused on information extraction, especially identifying entities and relations from domain-specific text and linking these entities to corresponding ontologies. One example application of information extraction in the medical domain is active surveillance in pharmacovigilance: I developed models to detect descriptions of adverse drug events in patient-written posts. I also created datasets and organised shared tasks on mapping these layman descriptions to standard terms in MedDRA, a medical dictionary used for regulatory purposes.

These days, my research focuses on building cost-effective domain-specific large language models that excel at understanding specialized text and capturing both implicit and explicit domain knowledge. I also work on human-centric AI, aiming to adapt AI systems to users' backgrounds and specific information needs. I am interested in understanding how AI can help people make informed decisions or act on complex information. For example, this may involve supporting a biologist to navigate scientific literature and simulation results to decide which genes to investigate for a particular trait, or helping patients understand their health records and follow medical advice.

I also work(ed) with students and Postdocs on topics including digital health, plain language summarization, multimodal learning, human–robot interaction, and LLM evaluation.

Education

University of Sydney
Ph.D., Natural Language Processing, 2017 - 2021
Supervisors: Sarvnaz Karimi, Ben Hachey, Cécile Paris
Thesis: Recognising Biomedical Names: Challenges and Solutions

University of Sydney
Master's Degree, Information Technology and Information Technology Management, 2015 - 2017
Supervisors: Joachim Gudmundsson, Michael Horton

South China University of Technology
Bachelor's Degree, Computer Science, 2003-2007

Experience

CSIRO [Sydney, Australia]
Research scientist, Aug 2023 - Present
Postdoc, Dec 2021 - Aug 2023

University of Copenhagen [Copenhagen, Denmark]
Postdoc, Feb 2021 - Dec 2021

Saarland University [Saarbrücken, Germany]
Visiting Researcher, Aug 2020 - Jan 2021, hosted by Dietrich Klakow

Bosch Center for Artificial Intelligence [Stuttgart, Germany]
Research Intern, Mar - Jul 2020

University of Sydney [Sydney, Australia]
Teaching Assistant, 2017 - 2019

CSIRO [Sydney, Australia]
Research Assistant, Feb - Jul 2017
Summer Intern, Nov 2016 - Feb 2017

Lanke Technology Co., Ltd. [Guangzhou, China]
Engineer, 2010 - 2014

Qiaoqing Technology Co., Ltd. [Guangzhou, China]
Engineer, 2008 - 2010

Publications

Journal

(33) Natural language processing methods to classify unplanned returns following dental extractions
Farhana Pethani, Jonathan K Kummerfeld, Albert Yaacoub, **Xiang Dai**, Mike Conway, Tanya Mahony, Sarvnaz Karimi, Heiko Spallek, Adam G Dunn
BMC Digital Health, 2026

(32) Predicting patient returns due to complications and recommending follow-up appointments after a dental extraction using machine learning
Farhana Pethani, Jonathan K Kummerfeld, **Xiang Dai**, Mike Conway, Albert Yaacoub, Sarvnaz Karimi, Heiko Spallek, Adam G Dunn
Discover Artificial Intelligence, 2026

(28) Extracting social determinants of health from dental clinical notes
Farhana Pethani, Alec Chapman, Mike Conway, **Xiang Dai**, Demiana Bishay, Victor Choh, Alexander He, Su-Elle Lim, Huey Ying Ng, Tanya Mahony, Albert Yaacoub, Sarvnaz Karimi, Heiko Spallek, Adam G Dunn
Applied Clinical Informatics, 2025

(26) MultiADE: A Multi-domain Benchmark for Adverse Drug Event Extraction
Xiang Dai, Sarvnaz Karimi, Abeed Sarker, Ben Hachey and Cécile Paris
Journal of Biomedical Informatics, 2024

(23) An Adaptive Approach to Noisy Annotations in Scientific Information Extraction
Necva Bölücü, Maciej Rybinski, **Xiang Dai**, Stephen Wan
Information Processing & Management, 2024

(16) Clinician-facing AI in the Wild: Taking Stock of the Sociotechnical Challenges and Opportunities for HCI
Hubert D. Zając, Dana Li, **Xiang Dai**, Jonathan F. Carlsen, Finn Kensing, Tariq Q. Andersen
ACM Transactions on Computer-Human Interaction (TOCHI), 2023

(11) Extracting Family History Information From Electronic Health Records: Natural Language Processing Analysis
Maciej Rybinski, **Xiang Dai**, Sonit Singh, Sarvnaz Karimi, Anthony Nguyen
JMIR Medical Informatics, 2021

Conference

(37) Improving the Evaluation of Biomedical Question Answering with Few Human Preference Signals
Shakila Mahjabin Tonni, **Xiang Dai**, Sarvnaz Karimi, Xiaomei Li, Samuel C. Andrew, Stephen Wan
Findings of the Association for Computational Linguistics: IJCNLP-AACL 2026

(36) The Model Knows Where to Look: Visual-Grounding-Guided Head Suppression for Mitigating Hallucination in LVLMs
Mong Yuan Sim, Wei Emma Zhang, **Xiang Dai**, Biaoyan Fang
The 5th Asia-Pacific Chapter of the Association for Computational Linguistics & the 15th International Joint Conference on Natural Language Processing (AACL-IJCNLP 2026)

(35) Beyond Caption Loss: Generative Distillation for Modality Alignment in Vision-Language Models
Nam Kha Nguyen, Wei Emma Zhang, **Xiang Dai**, Mong Yuan Sim, Weitong Chen
Findings of the Association for Computational Linguistics: EMNLP 2026

(34) Learning Pathology-Localized Medical Vision–Language Representations with Atomic and Grounded Disease Supervision
Mong Yuan Sim, Wei Emma Zhang, **Xiang Dai**, Biaoyan Fang, Miao Li
Findings of the Association for Computational Linguistics: EMNLP 2026

(29) The More, The Better? A Critical Study of Multimodal Context in Radiology Report Summarization
Mong Yuan Sim, Wei Emma Zhang, **Xiang Dai**, Biaoyan Fang, Sarbin Ranjitkar, Arjun Burlakoti, Jamie Taylor, and Haojie Zhuang
Findings of the Association for Computational Linguistics: EMNLP 2025

(27) Can VLMs Actually See and Read? A Survey on Modality Collapse in Vision-Language Models
Mong Yuan Sim, Wei Emma Zhang, **Xiang Dai**, and Biaoyan Fang
Findings of the Association for Computational Linguistics: ACL 2025

(25) A Critical Look at Meta-evaluating Summarization Evaluation Metrics
Xiang Dai, Sarvnaz Karimi and Biaoyan Fang
Findings of the Association for Computational Linguistics: EMNLP 2024

(24) Understanding Faithfulness and Reasoning of Large Language Models on Plain Biomedical Summaries
Biaoyan Fang, **Xiang Dai** and Sarvnaz Karimi
Findings of the Association for Computational Linguistics: EMNLP 2024

(22) Born Differently Makes a Difference: Counterfactual Study of Bias in Biography Generation from a Data-to-Text Perspective
Biaoyan Fang, Ritvik Dinesh, **Xiang Dai** and Sarvnaz Karimi
The 62nd Annual Meeting of the Association for Computational Linguistics (ACL 2024)

(20) Rethinking the Role of Entity Type in Relation Classification
Xiang Dai, Stephen Wan and Sarvnaz Karimi
The 13th International Joint Conference on Natural Language Processing and the 3rd Conference of the Asia-Pacific Chapter of the Association for Computational Linguistics (AACL-IJCNLP 2023)

(17) MultiFin: A Dataset for Multilingual Financial NLP
Rasmus Kær Jørgensen, Oliver Brandt, Mareike Hartmann, **Xiang Dai**, Christian Igel, Desmond Elliott
Findings of the Association for Computational Linguistics: EACL 2023

(14) Revisiting Transformer-based Models for Long Document Classification
Xiang Dai, Ilias Chalkidis, Sune Darkner, Desmond Elliott
Findings of the Association for Computational Linguistics: EMNLP 2022

(13) mDAPT: Multilingual Domain Adaptive Pretraining in a Single Model
Rasmus Kær Jørgensen, Mareike Hartmann, **Xiang Dai**, Desmond Elliott
Findings of the Association for Computational Linguistics: EMNLP 2021

(12) SearchEHR: A Family History Search System for Clinical Decision Support
Xiang Dai, Maciej Rybinski, Sarvnaz Karimi
International Conference on Information and Knowledge Management (CIKM 2021)

(10) An Analysis of Simple Data Augmentation for Named Entity Recognition
Xiang Dai, Heike Adel
International Conference on Computational Linguistics (COLING 2020)

(9) Cost-effective Selection of Pretraining Data: A Case Study of Pretraining BERT on Social Media
Xiang Dai, Sarvnaz Karimi, Ben Hachey, Cécile Paris
Findings of the Association for Computational Linguistics: EMNLP 2020

(7) An Effective Transition-based Model for Discontinuous NER
Xiang Dai, Sarvnaz Karimi, Ben Hachey, Cécile Paris
Annual Meeting of the Association for Computational Linguistics (ACL 2020)

(6) NNE: A Dataset for Nested Named Entity Recognition in English Newswire
Nicky Ringland, **Xiang Dai**, Ben Hachey, Sarvnaz Karimi, Cécile Paris, James R. Curran
Annual Meeting of the Association for Computational Linguistics (ACL 2019)

(5) Using Similarity Measures to Select Pretraining Data for NER
Xiang Dai, Sarvnaz Karimi, Ben Hachey, Cécile Paris
Conference of the North American Chapter of the Association for Computational Linguistics (NAACL 2019)

Workshop

(30) A Dataset and Benchmark on Extraction of Novel Concepts on Trust in AI from Scientific Literature
Melanie McGrath, Harrison Bailey, Necva Bölücü, **Xiang Dai**, Sarvnaz Karimi, Andreas Duenser, Cécile Paris
Australasian Language Technology Association Workshop (ALTA 2025)

(18) Can Social Media Inform Dietary Approaches for Health Management? A Dataset and Benchmark for Low-Carb Diet
Skyler Zou, **Xiang Dai**, Sarvnaz Karimi, Pennie Taylor and Grant Brinkworth
ACL Workshop on Biomedical Natural Language Processing (BioNLP 2023)

(3) Recognizing Complex Entity Mentions: A Review and Future Directions
Xiang Dai
ACL Student Research Workshop (ACL-SRW 2018)

(2) Medication and Adverse Event Extraction from Noisy Text
Xiang Dai, Sarvnaz Karimi, Cécile Paris
Australasian Language Technology Association Workshop (ALTA 2017)

(1) Automatic Diagnosis Coding of Radiology Reports: A Comparison of Deep Learning and Conventional Classification Methods
Sarvnaz Karimi, **Xiang Dai**, Hamed Hassanzadeh, Anthony Nguyen
ACL Workshop on Biomedical Natural Language Processing (BioNLP 2017)

Shared task

(31) Overview of the 2025 ALTA Shared Task: Normalise Adverse Drug Events
Diego Mollá, **Xiang Dai**, Sarvnaz Karimi, Cécile Paris
Australasian Language Technology Association Workshop (ALTA 2025)

(21) Exploring Instructive Prompts for Large Language Models in the Extraction of Evidence for Supporting Assigned Suicidal Risk Levels
Jiyu Chen, Vincent Nguyen, **Xiang Dai**, Diego Mollá, Sarvnaz Karimi, Cécile Paris
EACL Workshop on Computational Linguistics and Clinical Psychology (CLPsych 2024)

(19) CSIRO Data61 Team at BioLaySumm Task 1: Lay Summarisation of Biomedical Research Articles Using Generative Models
Mong Yuan Sim, **Xiang Dai**, Maciej Rybinski and Sarvnaz Karimi
ACL Workshop on Biomedical Natural Language Processing (BioNLP 2023)
Our system ranked 3rd for task 1 of BioLaySumm 2023 shared task among all 21 teams.

(15) Detecting Entities in the Astrophysics Literature: A Comparison of Word-based and Span-based Entity Recognition Methods
Xiang Dai, Sarvnaz Karimi
AACL-IJCNLP Workshop on Information Extraction from Scientific Publications (WIESP 2022)
Our system ranked 3rd for the DEAL shared task among all 12 teams.

(8) NLNDE at CANTEMIST: Neural Sequence Labeling and Parsing Approaches for Clinical Concept Extraction
Lukas Lange, **Xiang Dai**, Heike Adel, Jannik Strötgen
Iberian Languages Evaluation Forum (IberLEF 2020)
Our team ranked 4th for task 1; 5th for task 2; 4th for task 3 of the CANTEMIST shared task among all 24 teams.

(4) Shot Or Not: Comparison of NLP Approaches for Vaccination Behaviour Detection
Aditya Joshi, **Xiang Dai**, Sarvnaz Karimi, Ross Sparks, Cécile Paris, C Raina MacIntyre
EMNLP Workshop on Social Media Mining for Health Applications (SMM4H 2018)
Our system ranked 1st for task 4 of the SMM4H 2018 shared task among all 17 systems.

Talks

1 Challenges and Opportunities in AI4Xray
2021-Oct-08 at Department of Diagnostic Radiology, Rigshospitalet, Denmark

2 Active Adverse Event Surveillance: Are We Making Progress?
2025-Apr-24 at University of New South Wales (Guest lecture for COMP6713 Natural Language Processing course)

3 Domain-Specific VLMs: Can They See and Read?
2025-May-26 at Macquarie University (Guest lecture for COMP3420 Artificial Intelligence for Text and Vision course)

Other Academic Activities

Supervision

2 Mong Yuan Sim PhD (March 2024-present), Adelaide University, co-advised with Wei (Emma) Zhang and Biaoyan (Byron) Fang

9 Nam Kha Nguyen MPhil (Feb 2026-present), Adelaide University, co-advised with Wei (Emma) Zhang

10 Jiayue Chen PhD (Mar 2026 -present), Queensland University of Technology, co-advised with Will Browne, Markus Rittenbruch, Stephen Wan and Cécile Paris

8 Gang (Rexin) Cheng Master (May-Nov 2025), University of New South Wales, co-advised with Aditya Joshi

7 Shakila Tonni Postdoc (Nov 2024-Sep 2026), CSIRO, co-advised with Sarvnaz Karimi and Stephen Wan → Suncorp Bank

6 Ritvik Dinesh Intern (Nov 2023-Feb 2024), University of Sydney

5 Harrison Bailey Intern (Nov 2023-Feb 2024), Australian National University

4 Biaoyan (Byron) Fang Postdoc (Oct 2023-June 2024), CSIRO, co-advised with Sarvnaz Karimi → Oracle

3 Skyler Zou Intern (Dec 2022-Feb 2023), University of New South Wales

2 Mong Yuan Sim Honours (July 2023-Nov 2023), Adelaide University, co-advised with Wei (Emma) Zhang and Cécile Paris

Mong Yuan Sim Intern (Nov 2022-Feb 2023), Adelaide University

1 Anqi Wu Intern (Nov 2022-Feb 2023), Monash University

Conference PC (reviewer)

1 ACL Annual Meeting of the Association for Computational Linguistics 2020; 2021; 2023

2 EMNLP Conference on Empirical Methods in Natural Language Processing 2020 (Outstanding Reviewer); 2021; 2022; 2023

3 ACL Rolling Review 2021; 2022; 2023; 2024 (Action Editor; Senior Action Editor); 2025 (Action Editor); 2026

4 NAACL Conference of the North American Chapter of the Association for Computational Linguistics 2021

5 EACL Conference of the European Chapter of the Association for Computational Linguistics 2021 (Outstanding Reviewer); 2023

6 NeurIPS Conference on Neural Information Processing Systems 2021—2026

7 ICLR International Conference on Learning Representations 2022; 2024; 2025; 2026; 2027

8 AAAI Conference on Artificial Intelligence 2023—2026

9 AACL Conference of the Asia-Pacific Chapter of the Association for Computational Linguistics 2023 (Session chair)

10 ICML International Conference on Machine Learning 2023; 2024; 2025

11 COLING International Conference on Computational Linguistics 2024; 2025

12 COLM Conference on Language Modeling 2024; 2025; 2026

13 AISTATS International Conference on Artificial Intelligence and Statistics 2025

14 LREC International Conference on Language Resources and Evaluation 2026

Journal reviewer and editor

1 ACM Transactions on Intelligent Systems and Technology 2018
2 International Journal of Medical Informatics 2018,2021,2023
3 Language Resources and Evaluation 2020
4 Computer Speech & Language 2021
5 Informatics in Medicine Unlocked 2022
6 Computers in Industry 2022
7 npj Digital Medicine 2022, 2025
8 IEEE/ACM Transactions on Audio, Speech, and Language Processing 2022
9 Artificial Intelligence In Medicine 2024
10 Information Processing & Management 2024
11 Knowledge-Based Systems 2024, 2025
12 Humanities & Social Sciences Communications 2024
13 BMC Medical Informatics and Decision Making 2024, 2025
14 Computers in Biology and Medicine 2025
15 npj Artificial Intelligence 2025
16 Scientific Reports 2025
17 ACM Transactions on Computing for Healthcare 2025
18 ACM Transactions on Interactive Intelligent Systems 2025
19 Journal of Medical Systems 2025
20 JMIR Medical Informatics, 2026
21 ACM Transactions on Information Systems, 2026 (guest editor of special section 'Evaluating Multimodal Information Systems: Metrics, Benchmarks, and Reliability')

Workshop reviewer and organizer

1 ALTA Annual Workshop of the Australasian Language Technology Association 2019—2026
2 Student Research Workshop at ACL (2020, 2021, 2022, 2023, 2025); AACL (2020, 2022); NAACL (2022, 2024); EACL (2026)
3 Workshop on NLP for COVID-19 at EMNLP 2020
4 Workshop on Weakly Supervised Learning at ICLR 2021
5 Workshop on Information Extraction from Scientific Publications at AACL 2022
6 Workshop of Evaluation of Multimodal Generation at COLING 2025 (Co-organizer); SIGIR 2026 (Co-organizer)
7 Workshop on Document Intelligence and Understanding at EMNLP 2026

Membership

ALTA (Australasian Language Technology Association) Executive committee, 2019-2020; 2025-2026

ACL (Association for Computational Linguistics), 2018-present

Honors and Awards

Early Career Researcher Award
Analytics and Decision Sciences programme, CSIRO, 2025

Best Publication Award (ECR/PhD students category)
Analytics and Decision Sciences programme, CSIRO, 2022 and 2024

Postgraduate Research Support Scheme
USYD, 2019 and 2020

Engineering and Information Technologies Research Scholarship
AUD 27K per annum, 3.5 years
Faculty of Engineering and Information Technologies, USYD, 2018 - 2021

Data61 top-up Scholarship
AUD 10K per annum, 3.5 years
Data61, CSIRO, 2018 - 2021

SIT Summer Scholarships
AUD 6K
School of Information Technologies, USYD, November 2016 - February 2017

Postgraduate Coursework High Honour Roll
School of Information Technologies, USYD, April 2016, May 2017 and June 2018

MIT and MITM Half-Fee Scholarship
School of Information Technologies, USYD, April 2016

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