Chirag Nagpal, PhD

Research Scientist, Google Research

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Education

- **Carnegie Mellon University, Pittsburgh, USA**
  Doctor of Philosophy (Language and Information Technologies) *Fall 18 - 23*
  Survival and Time-to-Event Analysis, Graphical Models, Mixed-Integer Non-Linear Programming
  Committee : **Artur Dubrawski** (Chair), **Bhiksha Raj**, **Louis-Philippe Morency**,
  Russell Greiner (University of Alberta) and **Katherine Heller** (Google and Duke University)

  Master of Science (Language Technologies) *Fall 16 - 18*
  Coursework : Advanced Natural Language Processing, Advanced Multimodal Machine Learning,
  Neural Networks for Natural Language Processing, Machine Learning for Text Mining

- **Army Institute of Technology, University of Pune, India** *Fall 12 - 16*
  Bachelor of Computer Engineering
  First Position in Class, Chief of Army Staff Gold Medal in Academics

Experience

- *Research Scientist*, **Google Research**, San Francisco *Spring 23 -*
  Ensembles for Large Language Model Alignment,
  Refinement, Safety and Evaluation for Medical Assistant (MedPalm),
  Conversion Delay Modelling for Android App Ads,
  Uncertainty estimation for ranking and relevance in YouTube.

- *Research Intern*, **Responsible AI, Google Research** (Remote due to COVID-19) *Spring 22*
  Algorithmic Fairness in Integer Risk Scoring Systems.

- *Research Intern*, **Google Brain** (Remote due to COVID-19) *Summer 20*
  Deep Semi-Parametric Mixtures for calibrated estimation of Time-to-Event.

- *Summer Associate*, **JP Morgan AI Research**, New York City *Summer 19*
  Manager : Prof. **Manuela Veloso**, Dr. **Prashant Reddy**
  Bayesian methods to mitigate systemic analyst bias and error in equities forecasts.

- *Science for Social Good Fellow*, **IBM TJ Watson Research Center**, New York *Summer 18*
  Manager : Dr. **Kush R. Varshney**
  Causal neural networks to recover heterogeneous treatment effects.

Software

auton-survival : an Open-Source Package for Regression, Counterfactual Estimation, Evaluation and Phenotyping with Censored Time-to-Event Data. [Github Repository] [Docs] [Official Blog]

Teaching

CMU 10-708, Probabilistic Graphical Models *Fall 20*
Teaching Assistant for Prof. **Pradeep Ravikumar**. [webpage]

CMU 11-761, Language and Statistics *Fall 19*
Teaching Assistant for Prof. **Bhiksha Raj**. [webpage]

Publications

Pre-prints in Submission / Under Preparation

1. "Helping or Herding ? Reward Model Ensembles Mitigate but do not Eliminate Reward Hacking" [link]
   Jacob Eisentstein, **Chirag Nagpal**, Alekh Agarwal, Jonathan Berant and others.

2. "Reward Model Aggregation" [link]
   Zihao Wang, **Chirag Nagpal**, Sanmi Koyejo and Victor Veitch.

3. "Recovering Sparse and Interpretable Subgroups with Heterogeneous Treatment Effects
   with Censored Time-to-Event Outcomes" [link]
   Chirag Nagpal, Vedant Sanil, and Artur Dubrawski.

4. "Broadening the Time Horizon : Adaptive Risk Scores for Time-to-Event Prediction" [link]
   Chirag Nagpal, Artur Dubrawski and Berk Ustun.

Accepted Peer Reviewed Journal, Conference and Symposium Papers

5. "Participatory Systems for Personalized Prediction" [link]
   Hailey James, **Chirag Nagpal**, Katherine Heller, and Berk Ustun.
   NeurIPS - *Neural Information Processing Systems* '23 (**Spotlight Paper**)

6. "Counterfactual Phenotyping with Censored Time-to-Events" [arXiv] [code]
   Chirag Nagpal, Mononito Goswami, Keith Dufendach, and Artur Dubrawski
   KDD - *ACM Conference on Knowledge Discovery and Data Mining* '22

7. "auton-survival : an open-source package for Regression, Counterfactual Estimation, Evaluation and Phenotyping with Censored Time-to-Event Data" [arXiv] [code] [blog]
   Chirag Nagpal, Willa Potosnak, and Artur Dubrawski
   MLHC - *Machine Learning for Healthcare Conference* '22

8. "Deep Cox Mixtures for Survival Regression" [arXiv] [code]
   Chirag Nagpal, Steve Yadlowsky, Negar Rostamzadeh, and Katherine Heller
   MLHC - *Machine Learning for Healthcare Conference* '21
   Taught in Prof. David Sontag's Machine Learning for Health course at MIT and Harvard. [link]

9. "Deep Survival Machines : Fully Parametric Survival Regression and Representation Learning for Censored Data with Competing Risks" [arXiv] [code]
   Chirag Nagpal, Xinyu (Rachel) Li, and Artur Dubrawski
   JBHI - *IEEE Journal of Biomedical and Health Informatics* '21
   Spotlight Presentation at NeurIPS ML for Health Workshop '19, (Top 3% out of over 300 submissions.)

10. "Deep Parametric Time-to-Event Regression with Time-Varying Covariates" [arXiv] [code]
    Chirag Nagpal*, Vincent Jeanselme*, and Artur Dubrawski
    AAAI Spring Symposium - *Survival Prediction : Algorithms, Challenges and Application* '21

11. "Interpretable subgroup discovery in treatment effect estimation with application to opioid prescribing guidelines"
    Chirag Nagpal, Dennis Wei, Bhanukiran Vinzamuri, Monica Shekhar, Sara E. Berger, Subhro Das, Kush R. Varshney
    CHIL - *Conference on Health, Inference and Learning* '20 [arXiv] [code]

12. "Dynamically Personalized Detection of Hemorrhage"
    Chirag Nagpal, Xinyu (Rachel) Li, Michael R. Pinsky and, Artur Dubrawski
    MLHC - *Machine Learning for Healthcare Conference* '19 [arXiv]

Abstracts and Posters at Medical Conferences

13. **ICCAI '22**, "Identification of patients with stable coronary artery disease who benefit from ACE inhibitors using Cox mixture model for heterogeneous treatment effects"
    Van H Le, **Chirag Nagpal**, and Artur Dubrawski

14. **STS Coronary '22**, "Novel Machine Learning Technique Defines Patients Who Benefit from Off-Pump CABG"
    Keith Dufendach, **Chirag Nagpal**, Willa Potosnak, Artur Dubrawski, and David Kaczorowski

15. **ISICEM '22**, "Phenogrouping of hemorrhagic trauma patients using latent variable machine learning."
    Chirag Nagpal and Artur Dubrawski

16. **CCM '18**, "Accuracy of identifying venous thromboembolism by administrative coding compared to manual review."
    Tiffany Pellathy, Melissa Saul, Gilles Clermont, **Chirag Nagpal**, Artur Dubrawski, Michael Pinsky, and others.

Mentoring

Masters

- Fall '22 : **Shakirah Cooper**, Biomedical Engineering, Carnegie Mellon
- Fall '19 : **Xinyu (Rachel) Li**, Information Systems, Heinz College → Robotics PhD, Carnegie Mellon

Undergraduates

- Summer '22 : **Mingzhu Liu**, University of Michigan at Ann Arbor → Robotics MS, Carnegie Mellon
- Summer '22 : **Van H. Le**, Math and Economics, Hollins University, Virginia
- Fall '21 : **Willa Potosnak**, Biomedical Engineering, Duquesne University, PA → Robotics PhD, Carnegie Mellon

Service

Organization

Co-organizer for the **AAAI Spring Symposium on Survival Prediction 2021, 2023**

Reviewer

Journals : IEEE Journal of Biomedical and Health Informatics, Journal of Forecasting, Frontiers in Immunology
Conferences : NeurIPS, ICML, ICLR, MLHC, CHIL, ML4H

Departmental Service

Member, **School of Computer Sciences Dean's PhD Students Advisory Committee** [webpage]
Member, Admissions Committee, **Robotics Institute Summer Scholar's Program.** [webpage]
Chair, **SCS DEC/5, CMU Computer Science Graduate Students Social Organization.** [webpage]
Member, **International Student's Association**, Carnegie Mellon. [webpage]

Personal

Citizenship : Indian, **Languages** : English and Hindi
Interests : Equitation, Trivia Quizzing, Squash, Making and DIY, Amateur Radio Operator (Callsign : VU2CND)

References

Prof. **Artur Dubrawski**, Chair Professor of Computer Science, Carnegie Mellon.
Prof. **Bhiksha Raj**, Professor of Computer Science, Carnegie Mellon.
Prof. **Berk Ustun**, Assistant Professor, University of California, San Diego.