

# Vidhi Jain

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## Education

- 2022– **Doctorate in Robotics.**  
Present Carnegie Mellon University, The Robotics Institute, Pittsburgh, PA, USA, Advisor: Yonatan Bisk
- 2019– **Masters of Science in Robotics.**  
2021 Carnegie Mellon University, The Robotics Institute, Pittsburgh, PA, USA, *GPA 4.0*
- 2014– **Bachelor of Engineering (Honors) in Computer Science.**  
2018 Birla Institute of Technology and Science, Pilani, Rajasthan, India, *CGPA 9.06/10.00, Distinction*

## Publications and Presentations

- Jun 2022 *Vidhi Jain*, Yixin Lin, Eric Undersander, Yonatan Bisk, Akshara Rai, **Trasnformers are Adaptable Task Planners**, In submission, [\[Preprint\]](#)
- Oct 2020 *Vidhi Jain*, Rohit Jena, Huao Li, Tejus Gupta, Dana Hughes, Michael Lewis, Katia Sycara, **Predicting strategies in simulated search and rescue tasks**, NeurIPS AI+HADR 2020 [\[Video\]](#), [\[Preprint\]](#)
- Oct 2020 *Vidhi Jain*, Shishir Patil, Prakhar Agarwal, Katia Sycara, **Learning Embeddings that Capture Spatial Semantics for Indoor Navigation**, NeurIPS ORLR 2020. [\[Video\]](#), [\[Preprint\]](#), [\[Code\]](#)
- Sep 2020 *Vidhi Jain*, Ganesh Iyer, Katia Sycara, **Learning to navigate in unseen cluttered structured environments**, NeurIPS WiML 2020. [\[Poster\]](#)
- Jul 2020 *Vidhi Jain*, Simin Liu, Ganesh Iyer, **Coping with sample inefficiency in deep reinforcement learning (DRL) in embodied AI**, ICML'20 WiML un-workshop; Breakout Discussion session. [\[Discussion\]](#), [\[Presentation\]](#)
- Aug 2017 Sajjad Gholami, Oliver Schulte, *Vidhi Jain*, Qiang Zhao, **Model Selection Scores for Multi-Relational Bayesian Networks**, IJCAI'17 DeLPB. [\[Invited Paper\]](#)
- May 2017 *Vidhi Jain*, Prakhar Agarwal, **Symptomatic Diagnosis and Prognosis of Psychiatric Disorders through Personal Gadgets**, SRC at ACM CHI'17, Denver, USA. [\[Paper\]](#)
- Dec 2016 *Vidhi Jain*, Matthias Frank, **Empowering API Consumer Community: Collaborative Annotation of Web API Documentation for Semantically Structured Format**, GHCI'16, Bengaluru, India. [\[Abstract\]](#), [\[Poster\]](#)

## Experience

- Sep'21– **Meta (Facebook)**, Menlo Park, CA.
- Aug'22 AI resident with Akshara Rai and Yixin Lin
- Developed procedural generation of feasible trajectories for loading simulated dishwasher in AI Habitat Replica Synthetic Apartment 0 Kitchen.
  - Trained Encoder-decoder Transformer based high-level policy for learning preferences in loading dishwasher from a single demonstration as prompt. [\[Preprint\]](#)
  - Demonstrated the transfer to real hardware with Robot arm (Franka-Emika) to load dishes in drawers.

- Sep'19– **Advanced Agent-Robotics Technology Lab**, *Carnegie Mellon University, Pittsburgh.*
- Aug'21 Graduate Research Assistant with Prof Dr Katia Sycara
- **Minimap for Minecraft** Aggregated 2D representation of the Minecraft 3D voxelized map for urban search and rescue scenario by customizing gym-minigrid environment [\[Code\]](#), [\[Slides\]](#)
  - **Predicting Navigation intent for Artificial Social Intelligence for Successful Teams (ASIST)** Modelled navigation using Transformers to predict an individual's strategy based on their previous trajectory. [\[Paper\]](#),
  - **Visual dialogue for Human-robot tele-communication** Developed dialog driven navigation for embodied AI by adapting language models for identification of the target and its contextual attributes. [\[Code\]](#)
- Aug'18– **Microsoft Research (MSRI)**, *Bengaluru, India.*
- Aug'19 Research Fellow with Dr Amit Deshpande and Dr Navin Goyal
- **Divergence minimization in GANs** Investigated the properties of Jensen Shannon and Wasserstein divergences between the given and the generated distributions during training neural network generators, to discuss on the learning dynamics like convergence and generalization.
  - **Unsupervised learning from Information-theoretic perspective** Experimented with techniques like Contrastive Estimation, Predictive Coding and Mutual Information to explain the empirical performance of unsupervised learning strategies and the existing gap compared to the supervised performance.
- Jan'18– **Montreal Institute for Learning Algorithms (MILA)**, *Montreal, QC, Canada.*
- Jun'18 Research Intern with Prof Dr Aaron Courville and PhD student, Mr Faruk Ahmed
- **Out-of-Distribution Detection in Generative Models** Experimented on autoregressive generative models and Variational Autoencoders, to detect any 'out-of-distribution (OOD)' sample at deployment. [\[Thesis\]](#)
  - **Distillation in Generative Models** Investigated in probabilistic knowledge distillation in autoregressive generative models and looked into the challenges in minimizing only Kullback Leibler (KL) divergence between the two distributions modelled by teacher and student network for a high-dimensional output in generative models.
- May'17– **Simon Fraser University (SFU)**, *Burnaby, BC, Canada.*
- Jul'17 MITACS Globalink Research Intern with Prof Dr Oliver Schulte
- **Learning Bayesian Networks for Relational Databases** Remodelled existing codebase for project *FactorBase* to integrate cross table sufficient statistics or population variables in the contingency tables for learning ground level sufficient statistics. [\[Code\]](#)
- May'16– **Forschungszentrum Informatik (FZI)**, *Karlsruhe, Germany.*
- Jul'16 Research Intern with Prof Dr York Sure-Vetter and PhD student, Mr Matthias Frank
- **API annotation platform using Semantic Web** Designed and developed a customized Semantic MediaWiki for annotation of APIs for dynamic integration of provenance information in decision support system of Project *BigGIS*; Presented Technical Poster at Grace Hopper Celebration India GHCI'16, Bengaluru, India;

## Academic Projects

- Mar'20– **Learning Diverse Goal-Conditioned Policies for Frontier Selection in Navigation.**
- May'20 Deep Reinforcement Learning for Robotics : Decomposed the task of map exploration into modular differentiable policies that can be combined hierarchically for navigation strategy. Particularly, implemented and analysed the 'global' policy for proposing frontier locations that lead to high coverage, and created submaps from planner for 'local' policy, that was trained for low-level control. [\[Report\]](#)
- Nov'19– **Towards Zero-Shot Alignment and Retrieval for Forensic Detection.**
- Dec'19 Intro to Machine Learning (PhD) : Implemented the synthetic data pipeline and noise removal architecture for matching probed shoe-prints with the reference image. [\[Report\]](#)

## Selected Awards and Honors

- Aug 2020 **CIFAR Deep Learning Reinforcement Learning Summer School**
- Apr 2020 **Young Researcher at Heidelberg Laureate Forum (HLF '20)** among 224 young researchers worldwide supported by Romberg Grant
- Jul 2019 **J N Tata Endowment Scholarship for Higher Studies, India**

- Jun 2019 **K. C. Mahindra Scholarships for Post-Graduate Studies Abroad**
- Mar 2017 **Citi Women Leader Award (CWLA), Mumbai, India**, Awarded one year of study scholarship covering upto INR 400,000 ~ USD 6000, among top 3 out of 1200 applicants
- Jun 2016 **GE Foundation Scholar-Leaders Program (GEFSLP)**, Awarded USD 2000 for two years of study, among top 5 scholars selected in India
- 2014–15 **Merit Scholarship** by Dean, BITS Pilani, *Top 1% among the batch of about 900 students*
- 2013 **Awarded Kishore Vaigyanik Protsahan Yojna (KVPY) Fellowship** by Dept of Science and Tech., Govt. of India
- 2010 **Awarded National Talent Search Exam (NTSE) Scholarship** by NCERT, India
- 2010 **National Standard Examination in Junior Science (NSEJS) (Top 1% in Regional State)**

## Talks

- Oct 2021 SAI DL (Virtual) - *3 brushes to paint your research canvas* [\[Video\]](#), [\[Event Poster\]](#)
- May 2019 PyLadies Bangalore - *Tutorial on Deep Learning with PyTorch* [\[Presentation\]](#) [\[Event Poster\]](#)
- Jan 2019 *The one in Asankhya project* [\[Video\]](#)
- Aug 2018 IIIT-Bangalore ACM Student Chapter [\[Video\]](#)
- Jul 2017 Six students for panel discussion on 'Innovation by Young India', telecasted on national news channel NDTV India [\[Video\]](#)

## Professional Service and Leadership

- Jan 2020– Present **Reviewer** at International Conference on Machine Learning (ICML), Neural Information Processing and Signal (NeurIPS) and International Conference on Learning Representations (ICLR).
- Sep'17– **Co-Founder and Vice Chair** | BITS Pilani Association for Computing Machinery-Women Chapter,
- May'18 *Started with 16 on-campus girls, organized project brainstorming and mentoring sessions*
- Jan'17– **Teaching Assistant** | CS F111 Computer Programming by Prof. Dr. Vishal Gupta, *Mentored 35*
- May'17 *students for 4 hours per week for C programming lab sessions*
- May'15– **Technical Volunteer** | ARISE Impact, non-profit organization *Developed Android application for Audio*
- Aug'15 *based learning for visually challenged*
- Aug'14– **Teaching Volunteer** | Computer Literacy Programme, National Service Scheme, *Tutored 12-15 rural*
- May'15 *natives for 3 hours per week on computer applications*

## Courses

- Intro to Machine Learning (PhD)
- Convex Optimization
- Deep RL for Robotics (seminar)
- Deep Reinforcement Learning and Control (intro)

## References

**Yonatan Bisk**, Assistant Professor, Carnegie Mellon University, [ybisk@andrew.cmu.edu](mailto:ybisk@andrew.cmu.edu)  
**Akshara Rai**, Research Scientist, Meta (previously Facebook), Menlo Park, [akshararai@fb.com](mailto:akshararai@fb.com)  
**Katia Sycara**, Edward Fredkin Research Professor of Robotics, [katia@cs.cmu.edu](mailto:katia@cs.cmu.edu)  
**David Held**, Assistant Professor, Carnegie Mellon University, [dheld@andrew.cmu.edu](mailto:dheld@andrew.cmu.edu)  
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