



Sonia Raychaudhuri, Ph.D. candidate

 <https://sonia-raychaudhuri.github.io>

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PhD Advisor – Angel X. Chang

Affiliations – Simon Fraser University [3dlg-hcvc] [GrUVi]

Collaborators – Manolis Savva, Unnat Jain, Bernadette Bucher, and many more.



Summary

My research in embodied AI and multimodal reasoning focuses on pushing the boundaries of AI-driven autonomy, bridging vision, language and spatial reasoning to enhance robotic intelligence.







During my internship at the Robotics and AI Institute, I developed a novel natural-language grounded instruction-following method, demonstrating its zero-shot navigation capabilities on a real Spot robot. My work has been published in top-tier conferences, and I bring both academic rigor and industry experience, having previously worked as a Software Engineer.

I am passionate about advancing multimodal reasoning by integrating cutting-edge techniques to develop intelligent, adaptable and impactful solutions.

Skills

- Embodied AI, Multimodal Reasoning, Natural Language Understanding, Reinforcement Learning, Deep Learning, Python, PyTorch



Research Publications

- 1 S. Raychaudhuri, E. Cancelli, T. Campari, L. Ballan, M. Savva, and A. X. Chang, *LangNavBench: Evaluation of Natural Language Understanding in Semantic Navigation (under review)*, 2025. arXiv: 2507.07299.  URL: <https://3dlg-hcvc.github.io/langmonmap/>.
- 2 S. Raychaudhuri and A. X. Chang, *Semantic Mapping in Indoor Embodied AI – A Survey on Advances, Challenges, and Future Directions (accepted to TMLR)*, 2025. arXiv: 2501.05750 [cs.RO].  URL: <https://arxiv.org/abs/2501.05750>.
- 3 S. Raychaudhuri, D. Ta, K. Ashton, A. X. Chang, J. Wang, and B. Bucher, *Zero-shot Object-Centric Instruction Following: Integrating Foundation Models with Traditional Navigation*, 2025. arXiv: 2411.07848.  URL: <https://sonia-raychaudhuri.github.io/nlslam/>.
- 4 S. Raychaudhuri, T. Campari, U. Jain, M. Savva, and A. X. Chang, “MOPA: Modular Object Navigation With PointGoal Agents,” in *WACV*, 2024.  URL: <https://3dlg-hcvc.github.io/mopa>.
- 5 Q. Wu, S. Raychaudhuri, D. Ritchie, M. Savva, and A. X. Chang, “R3DS: Reality-linked 3D scenes for panoramic scene understanding,” in *European Conference on Computer Vision*, Springer, 2024, pp. 452–468.
- 6 M. Deitke, D. Batra, Y. Bisk, *et al.*, *Retrospectives on the embodied ai workshop*, 2022. arXiv: 2210.06849 [cs.CV].  URL: <https://arxiv.org/abs/2210.06849>.
- 7 S. Raychaudhuri, S. Wani, S. Patel, U. Jain, and A. Chang, “Language-Aligned Waypoint (LAW) Supervision for Vision-and-Language Navigation in Continuous Environments,” in *EMNLP*, 2021.  URL: <https://3dlg-hcvc.github.io/LAW-VLNCE>.
- 8 X. Xu, D. Charatan, S. Raychaudhuri, *et al.*, “Motion annotation programs: A scalable approach to annotating kinematic articulations in large 3D shape collections,” in *2020 International Conference on 3D Vision (3DV)*, IEEE, 2020, pp. 613–622.

Ongoing Projects




Fine-tuning VLM reasoning for semantic navigation, 2025. F. Taioli, S. Raychaudhuri, U. Jain, A. Chang.

Education




- 2019 – present  **Ph.D., Simon Fraser University** Computer Science
Thesis title: *Toward Navigation Agents that Understand and Generalize via Spatial Semantic Representations*.
- 2003 – 2007  **B.E., Indian Institute of Engineering Science and Technology, Shibpur (IIST)**
in Information Technology

Employment History

Industry

- January – June 2024  **Research Intern.** Robotics and AI Institute, Cambridge, MA, USA.
- 2011 – 2019  **Senior Software Engineer.** Ericsson India Global Services Pvt. Ltd., India.
- 2007 – 2011  **Software Engineer.** Tata Consultancy Services Pvt. Ltd., Kolkata, India.

Teaching


- Fall 2021  **Graduate Teaching Assistant**, Natural Language Processing. Simon Fraser University, Burnaby, Canada.
- Spring 2021  **Graduate Teaching Assistant**, Grounded Natural Language Understanding. Simon Fraser University, Burnaby, Canada.
- Fall 2020  **Graduate Teaching Assistant**, Natural Language Processing. Simon Fraser University, Burnaby, Canada.

Miscellaneous Experience







Awards and Achievements

- 2022  **Outstanding TA Award** Computer Science, Simon Fraser University.

Peer Reviews

- Intl. Conferences.  TPAMI (certificate), ICRA, IROS, RA-L, CVPR, ICCV, ACL ARR, CRV, WACV, SIGGRAPH, SIGGRAPH Asia, IJCV, and more.

Others

- July 2025  **Volunteered** in WiML Symposium @ ICML.
- June 2024  **Co-hosted MultiON challenge.** Embodied AI Workshop @ CVPR. [video]
- 2023  **Co-organized** Visual Computing and Robotics (VCR) weekly seminars at SFU.
- June 2023  **Co-hosted MultiON challenge.** Embodied AI Workshop @ CVPR. [video]
- 2022  **Organized** Reading Group at the 3dlg Lab in SFU.
- June 2022  **Co-hosted MultiON challenge.** Embodied AI Workshop @ CVPR. [video]

References

Available on Request