Sonia Raychaudhuri

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PhD Advisor – Angel X. Chang

Affiliations – Simon Fraser University [3DLG] [GrUVi]

Research – Embodied AI, semantic navigation, multimodal reasoning, semantic mapping

Summary

I am an **Embodied AI researcher** specializing in **robot navigation** and **multimodal spatial reasoning**, with a focus on building robust human-centric autonomy for real-world environments. I received my Ph.D. from SFU in February 2026, advised by Angel Chang. My work aims at building **autonomous real-world systems** by bridging vision, language and spatial representations and enabling robots to understand instructions, navigate efficiently and generalize to unknown environments.

Skills

- 🔖 Embodied AI • Semantic Navigation • Instruction Following • Multimodal Reasoning
- 🔖 Natural Language Understanding • Reinforcement Learning • Deep Learning • Python • PyTorch

Research Highlights

1. 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/.

2. 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.

3. 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.

4. 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/.

5. 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.

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. F. Taioli, S. Yang, S. Raychaudhuri, M. Cristani, U. Jain, and A. X. Chang, *VISOR: VIsual Spatial Object Reasoning for Language-driven Object Navigation*, 2026. arXiv: 2602.07555 [cs.CV]. 🔗 URL: https://arxiv.org/abs/2602.07555.

Education

2019 – Fall 2025	🔖 **Ph.D., Simon Fraser University** in Computer Science. CGPA: 4.0 [Thesis]
2003 – 2007	🔖 **B.E., Indian Institute of Engineering Science and Technology, Shibpur (IIEST)** CGPA: 4.0

Employment History

Industry

January – June 2024	▌**Research Intern.** Robotics and AI Institute, Cambridge, MA, USA. Role: Conducted research on embodied AI and robotic perception/navigation, focusing on semantic understanding, instruction following, and zero-shot generalization in real-world environments. Responsibilities: • Designed and implemented hybrid autonomous solution for instruction-conditioned navigation that works seamlessly on both simulated environments and real-world robots. • Collaborated with cross-functional teams including research scientists and engineers. • Authored technical reports and contributed to research publications.
2011 – 2019	▌**Senior Software Engineer.** Ericsson India Global Services Pvt. Ltd., India. Role: Led development of large-scale telecom software systems, delivering reliable, high-performance backend services and mentoring junior engineers.
2007 – 2011	▌**Software Engineer.** Tata Consultancy Services Pvt. Ltd., Kolkata, India. Role: Developed enterprise software applications and supported client-facing systems in a large-scale IT services environment.

Teaching

Spring 2026	▌**Graduate Teaching Assistant**, Natural Language Processing. SFU, Canada.
Fall 2021	▌**Graduate Teaching Assistant**, Natural Language Processing. SFU, Canada.
Spring 2021	▌**Graduate Teaching Assistant**, Natural Language Understanding. SFU, Canada.
Fall 2020	▌**Graduate Teaching Assistant**, Natural Language Processing. SFU, 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