Senjuti Dutta, PhD

Curriculum Vitae

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Github: https://github.com/sduyr/

Research Statement

My research combines Human-Computer Interaction and Applied AI to enhance flexibility and inclusivity in digital environments. I have developed design guidelines to support crowdworkers' flexibility by enabling the use of various devices beyond traditional desktops and laptops, modeled diverse perspectives in AI, and refined Large Language Models (LLMs) to handle nuanced content. Additionally, I have created accessible communication tools for marginalized communities and optimized data processes for various AI applications, consistently bridging user research with software development to promote equity, inclusion and flexibility.

Education

University of Tennessee, Knoxville, TN, USA *2020 - 2024*
Doctorate of Philosophy (Ph.D), Computer Science
Advisor: Dr. Scott Ruoti
Committee members: Dr. Alex Williams, Dr. Anastasia Kuzminykh, Dr. Audris Mockus

University of Memphis, Memphis, TN, USA *2017 - 2020*
Master's of Science (MS), Computer Science
Thesis: *Enabling Efficient and Privacy-Preserving Task Matching*

Maulana Abdul Kalam Azad University of Technology, West Bengal, India *2012 - 2016*
Bachelor's of Computer Science and Engineering (BS), Computer Science

Work Experience

AImpower.org *August 2024- Present*
Research and Engineering Fellow

- Addressed the needs of more than 80 million people globally, including 3 million Americans who stutter, through the front end development of accessible communication tools.

Keywords Studios *May 2024- July 2024*
Human Data Project Manager Intern

- Curated and processed large datasets for training and testing LLMs, enhancing their effectiveness and applicability across multiple use cases for clients like Adept AI.
- Identified and addressed critical operational inefficiencies, contributing to smoother project execution and enhanced overall performance.

University of Tennessee, Knoxville
Graduate Research Assistant, Dept. of Computer Science *December 2020 - July 2024*

- Led studies revealing the need for greater flexibility among crowdworkers by enabling work across various devices and analyzing usage patterns.
- Identified platform-specific traits to inform strategies that enhance flexibility and optimize device use.
- Applied AI to categorize crowdworker profiles and developed personalized guidelines for seamless task management and completion across multiple devices.

Google *August 2022 - May 2023*
Student Researcher

- Led efforts to investigate and model subjectivity in AI through the soft tuning of LLMs, enhancing their ability to handle nuanced and context-sensitive content.
- Employed deep generative models to innovate in creative domains, including story writing, expanding the applications and versatility of AI.

University of Tennessee, Knoxville
Graduate Teaching Assistant, Dept. of Computer Science *August 2020 - July 2022*

- Directed Python lab sessions for over 50 students, providing hands-on guidance and support to enhance their understanding of python programming and data science concepts.
- Graded homework, projects, and exams for multiple advanced courses, ensuring fair and consistent assessment across subjects for around 80 students, including: DATA 201: Data Knowledge and Discovery, COSC 522: Machine Learning and ECE 462: Cyber-Physical Systems Security.

University of Memphis *August 2017- May 2020*
Graduate Research Assistant, Dept. of Computer Science

- Designed and implemented advanced algorithms for keyword matching in crowdsourcing systems, ensuring the protection of both keyword and user privacy.
- Created and executed algorithms to efficiently convert between morphed and standard images of passport, optimizing performance and accuracy in image processing tasks.
- Developed and delivered instructional courses on multi-factor authentication and authorization, increasing user security awareness and compliance.

University of Memphis *January 2018- April 2020*
Graduate Teaching Assistant, Dept. of Computer Science

- Led over 10 classes across undergraduate and graduate levels, providing office hours in explaining the concepts of key computer science subjects: Python Programming (COMP 4030/6030), Graduate Database Course (COMP 7115) and Object-Oriented Programming and Data Structures (COMP 2150).
- Guided undergraduate, masters and phd students in developing and refining their final course projects, helping them apply theoretical knowledge to practical scenarios.

Jadavpur University *November 2016- July 2017*
App Developer Intern, Center for Studies and Rehabilitation of Differently Abled Persons

- Created an Android app that accurately determines user location and orientation, leveraging GPS and sensor data to provide reliable real-time navigation.
- Designed and implemented an audio instruction system tailored for individuals with visual impairments, enhancing app accessibility and usability by providing clear, spoken directions for navigation.

Publication

Peer-Reviewed Recently Accepted Papers

[UR.1] **S. Dutta**, R. Linder, A. Williams, A. Kuzminykh, S. Ruoti . Unveiling the Inter-Related Preferences of Crowdworkers: Implications for Personalized and Flexible Platform Design (HCOMP 2024).

[UR.2] K. Collins, N. Kim, Y. Bitton, V. Rieser, S. Omidshafiei, Y. Hu, S. Chen, **S. Dutta** , M. Chang, K. Lee, Y. Liang, G. Evans, S. Singla, G. Li, A. Weller, J. He, D. Ramachandran, K. Dj Dvijotham. Beyond Thumbs Up/Down: Untangling Challenges of Fine-Grained Feedback for Text-to-Image Generation (ICML 2024 Workshop).

[UR.3] K. Collins, N. Kim, Y. Bitton, V. Rieser, S. Omidshafiei, Y. Hu, S. Chen, **S. Dutta** , M. Chang, K. Lee, Y. Liang, G. Evans, S. Singla, G. Li, A. Weller, J. He, D. Ramachandran, K. Dj Dvijotham. Beyond Thumbs Up/Down: Untangling Challenges of Fine-Grained Feedback for Text-to-Image Generation (AIES 2024).

Arxiv Papers

[AR.1] **S. Dutta** , S. Mittal, S.Chen, D. Ramachandran, R. Rajakumar, I. Kivlichan, S. Mak, A. Butryna, P.Paritosh. Modeling subjectivity (by Mimicking Annotator Annotation) in toxic comment identification across diverse communities.

[AR.2] K. Collins, N. Kim, Y. Bitton, V. Rieser, S. Omidshafiei, Y. Hu, S. Chen, **S. Dutta** , M. Chang, K. Lee, Y. Liang, G. Evans, S. Singla, G. Li, A. Weller, J. He, D. Ramachandran, K. Dj Dvijotham. Beyond Thumbs Up/Down: Untangling Challenges of Fine-Grained Feedback for Text-to-Image Generation

[AR.3] **S. Dutta** , S.Chen, S. Mak, A. Ahmad, K. Collins, A. Butryna, D. Ramachandran, R. Rajakumar, K. Dvijotham, E. Pavlick. Understanding Subjectivity through the Lens of Motivational Context in Model-Generated Image Satisfaction.

[AR.4] R. Elgedawy, J. Sadik, **S. Dutta**, A. Gautam, K. Georgiou, F. Ji, K. Lim, Q. Liu, S. Ruoti. Ocassionally Secure: A Comparative Analysis of Code Generation Assistants

Peer-Reviewed Conference Papers

[C.1] Lee, M., Gero,K., Chung,J., Shum, S., Raheja, V., Shen, H., Venugopalan, S., Wambsganss, T., Zhou. D, Alghamdi, E., August, T., Bhat, A., Choksi, M., **Dutta, S.** more 22 authors. A Design space for Intelligent and Interactive Writing Assitants.(accepted at CHI 2024)

[C.2] **Dutta, S.**, Linder, R., Lowe, D., Rosenbalm, R., Kuzminykh, A., Williams, A. C. (2022, April). Mobilizing crowdwork: A systematic assessment of the mobile usability of hits. In CHI Conference on Human Factors in Computing Systems (pp. 1-20).

[C.3] Linder, R., Hunter, C., McLemore, J., **Dutta, S.**, Akbar, F., Grover, T., ... Williams, A. C. (2022). Characterizing Work-Life for Information Work on Mars: A Design Fiction for the New Future of Work on Earth. Proceedings of the ACM on Human-Computer Interaction, 6 (GROUP), 1-27.

[C.4] Yang, K., **Dutta, S.** (2021, June). Secure and Efficient Task Matching with Multi-keyword in Multi-requester and Multi-worker Crowdsourcing. In 2021 IEEE/ACM 29th International Symposium on Quality of Service (IWQOS) (pp. 1-6). IEEE.

[C.5] **Dutta, S.**, Barik, M. S., Chowdhury, C., Gupta, D. (2018, January). Divya-Dristi: A smartphone based campus navigation system for the visually impaired. In 2018 Fifth International Conference on Emerging Applications of Information Technology (EAIT) (pp. 1-3). IEEE.

Peer-Reviewed Workshop Papers

[W.1] **S. Dutta**, R. Linder, D. Lowe, M.Rosenbalm, A. Kuzminykh, and A. Williams. The Productivity Paradox: Understanding Tooling Biases in Crowdwork (*CSCW 21 Workshop - Investigating and Mitigating Biases in Crowdsourced Data.*)

[W.2] **S. Dutta**, R. Linder, A. Kuzminykh, and A. Williams. Doing Work from Where You Are: AI HIT Management Dispatching Work Tailored to Context (*Accepted at the CHI 22 Crowd Science Workshop.*)

[W.3] S. Chen, C. Morgan, D. Oslen, E. Manilow , K. McDowell, M. Nelson, Q. Zhang, **S. Dutta**. Towards an Authorial Leverage Evaluation Framework for Expressive Benefits of Deep Generative Models in Story Writing (*Accepted at In2Writing Workshop CHI 2023*)

Peer-Reviewed Posters

[P.1] **S. Dutta**, R. Linder, S. Ruoti, A. Williams and A. Kuzminykh. Beyond a One-Size-Fits-All Approach: Towards Personalizing Multi-device Setups in Crowdwork (*Accepted at the UbiComp/ISWC '22.*)

Skills

Programming Languages	Python, R, C, C++, JavaScript, CSS, Java, HTML, SQL, Ruby
Shell Scripting Language	Bash, Sh, Python, Powershell, MSDOS, PHP
AI Library/ Package	PyTorch, Keras, NumPy, Pandas, Scikit-Learn, TensorFlow, Langchain
Web Scraping Tools	Beautiful Soup, Selenium
Quantitative Tooling	Pandas, R, Matplotlib, Seaborn
Qualitative Tooling	nVivo, Qualtrics, SurveyMonkey
Experimental Design	Crowdsourced Studies, Online Surveys, Lab Studies, Interview
Productivity Tool	Google Docs, Slides, Sheets, Microsoft Word, Excel, PowerPoint.
Design Software	Sketch, MockFlow, Adobe Creative Suite, Miro, Figma
Statistical Software	OpenStat, Scipy

Community Services

Reviewer	Globecom, IEEE Mass, IEEE CISS Symposium, DIS, ACL Rolling Review
Student Vounteer	CSCW 2021, HCOMP 2021, CHI 2022
Co-Chair	Publicity and Networking Co-Chair HCOMP 2024
Program Commitee Member	HCOMP 2024
Workshop Organizer	Deep Learning Indaba 2024 Workshop
Vounteer	Core Committee Member in Indian Student Organization called Manthan in UTK from 2021-2023

Awards and Honors

Graduate Student Senate Award
for Excellence in Graduate Research *April 2024*
Yates Dissertation Fellowship *August 2023*
Appearance on University Of Tennessee Newsletter *March 2022*
Junior School State Government Fellowship *December 2004*