Charan Pushpanathan Prabavathi MS

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Education

Pennsylvania State University, University Park — State College, PA
MS. in Informatics, Human Computer Interaction — 08/ 2023 - 05/ 2025 *(expected)*

- Advisor: Prof. John M. Carroll
- GPA: 4.0/4.0

Kumaraguru College of Technology, Affl. Anna University — Coimbatore, India
B.E. in Computer Science and Technology — 08/ 2019 - 04/ 2023

- Advisor: Prof. L. Latha and Prof. G. Kanagaraj
- GPA: 8.12/10.0, Rank: First Class.

Publications

1. Ya Fang Li, Xiaotian Li, Wan Hsuan Huang, **Charan Pushpanathan Prabavathi**, Jie Cai, John M Carroll. Parental Collaboration and Closeness: A Co-Design Exploration with New Couple Parents. *CHI Conference on Human Factors in Computing Systems [**Under Review**]*, 2025.
2. **Charan Pushpanathan Prabavathi**, Ya Fang Li, John M Carroll. Design Rationale: Co-Ordination System. *Extended Abstracts of the CHI Conference on Human Factors in Computing Systems [**ongoing**]*, 2025.

Research Experience

Graduate Research Assistant, *Collaboration Innovation Laboratory*
College of Information Sciences and Technology, State College, PA — 01/ 2024 - Present

- Through 10 co-design workshops with parent couples, we explored how technology could enhance co-parenting closeness. Our qualitative analysis revealed opportunities for technologies that promote interdependence and integrate positive emotions into shared parenting experiences.
- Led design and prototype development of a novel co-parenting technology system as primary author; preparing extended abstract submissions
- Conducted comprehensive analysis of 80+ research papers spanning HCI, sociology, and anthropology to inform co-parenting technology design
- Synthesized multi-disciplinary literature on family relationships, closeness, and togetherness to structure research direction, Leads to CHI-2025

Teaching Experience

IST 505 - Foundations of Research Design in Information Sciences and Technology
w/ Prof. Xiaolong Luke Zhang, College of IST — Spring 2025

IST 526 - Development Tools and Visualizations for Human-Computer Interaction
w/ Prof. Xiaolong Luke Zhang, College of IST — Spring 2025

IST 402 - Emerging Issues and Technology: Computer Graphics and Virtual Reality
w/ Prof. Xiaolong Luke Zhang, College of IST — Fall 2024

IST 504 - Foundations of Theories and Methods of Information Sciences and Technology Research
w/ Prof. Xiaolong Luke Zhang, College of IST — Fall 2024

Professional Experience

Product Designer Intern
HDFC Bank Limited, India 11/ 2022 - 06/ 2023

- Spearheaded design efforts in account aggregator financial data sharing, bill payments & utilities, schemes, lending services, consumer rewards, and payments.
- Implemented comprehensive benchmarking activities resulting in visual design enhancements. Led innovation assistive technology product ideation to build phase as an individual.
- Revamped interfaces for digital banking (achieving a 93% User Acceptance Testing (UAT) success rate for the new system), performed field studies, and developed information architectures.

Founding Member and Designer
Angel Startup in Capital Market (Closed Startup), India 08/ 2022 - 10/ 2022

- As founding designer, led design and strategy for the biggest capital market platform for supporting social learning and investing.
- Planned interfaces for prototyping presented in pitches, conceptualized the business model, and catered to customer requirements.
- Explored diverse concepts in the Indian capital markets, spanning stocks, brokerage, lending, and investments.
- A team of 6 individuals, ahead of seed funding, has closed the startup due to a regulatory impact in the securities market.

Product Designer Intern
Freecharge backed by Axis Bank Limited, India 07/ 2021 - 01/ 2022

- Focused on Neo-Banking (20M users) emailers, Pay-later (30M users) features, the wallet application for Axis Bank, mutual funds, utility bill payments, and user account management.
- Designed interfaces and product revamps, PWAs, and wireframes, and spearheaded qualitative research. Research focuses on user interviews, field studies, usability tests, A/B tests, and design iterations.
- Nominated for the Tech Award due to significant contributions to Neo-banking emailers along with ten senior designers.

Selected Projects and Collaborations

Trust and Decision-Making with Explainable AI in XR - Literature Review
IST 597: Explainable AI, w/ Prof. Jonathan Dodge[a] Fall 2024

- Contributed to systematic literature review we analyzed 89 papers on trust and decision-making in XR environments, identifying key mechanisms for AI explainability and user trust calibration.
- Developed framework for evaluating explanation techniques in immersive interfaces, examining impact of visualization methods on user understanding and trust formation.
- Analyzed ethical implications of AI in XR applications, focusing on transparency, bias mitigation, and trust calibration strategies for human-AI collaboration.

Machine Learning and Reinforcement Learning - Course Project
IST 597: Explainable AI, Prof. Jonathan Dodge Fall 2024

- Developed and evaluated MDP agents using Q-learning, policy iteration, and deep Q-networks, implementing agents for sequential decision-making that achieved optimal policies across multiple domains.
- Implemented feature engineering techniques and debiasing transformations for explainable machine learning models, focusing on fairness and bias mitigation in high-stakes decision domains.
- Analyzed model behavior and decision boundaries using multiple explainable AI frameworks (AIX360, LIME, SHAP), generating interpretable explanations and visualizations to assess model predictions and feature importance.
- Created Markov Decision Process models and hierarchical task analysis for sequential planning domains, achieving optimal policies through value/policy iteration and reinforcement learning approaches.

Natural Language Understanding - Course Project
IST 597: Human Centered Artificial Intelligence, w/ Prof. Syed Billah Fall 2024

- Developed a conversational AI agent using LangChain and custom tools, implementing arithmetic operations and web crawling capabilities with vector storage for enhanced information retrieval and real-time content understanding.
- Built and fine-tuned a GPT-2 language model using PEFT/LoRA techniques to convert natural language queries into First-Order Logic statements, achieving performance comparable to larger models while maintaining efficiency.
- Created a multimodal chatbot integrating vision language model (Phi-3), speech recognition (Whisper), text-to-speech (FastSpeech2), and image generation (Stable Diffusion) capabilities through Hugging Face's ecosystem.
- Implemented reinforcement learning agents using MinWoB++ and Gymnasium environments to automate UI tasks, incorporating workflow-guided exploration (WGE) and learning from human demonstrations for web automation.

Post and Gather - Course Project
IST 521: HCI - Human and Technology, w/ Prof. Frank E Ritter Spring 2024

- Conducted qualitative user research through in-depth interviews with event organizers (n=1) and attendees (n=4), employing structured interview protocols and thematic analysis to identify key user needs.
- Performed Hierarchical Task Analysis (HTA) to decompose complex event management workflows, identifying 10 critical tasks and optimizing system architecture based on user behavior patterns.
- Applied evidence-based HCI methodologies including task analysis, user journey mapping, and iterative prototyping to develop an integrated event platform serving Penn State's 24 campuses.
- Leveraged qualitative findings to implement user-centered features like personalized event feeds and automated notifications, addressing specific pain points identified through systematic research.

[a] https://charanpushpanathan.com/files/IST597XAI.pdf

Invited Talks

Persuasive Design: Influencing Billions of Mobile Users
Dept of CSE, Kumaraguru College of Technology 01/ 2023

How to Present an Presentation - VC pitches and Academia
Dept of CSE, Kumaraguru College of Technology 12/ 2022

Skills

Languages: Tamil, English.

Software: Sketch, Figma, Keynote, Zeplin.

Programming: `Python`, `JavaScript`, `NoSQL`, `Cloud Computing`, `HTML/CSS`, `Data Visualization`

Test Scores

American English Oral Communicative Test (AEOCPT), 293/300
Dept of Applied Liguistics, Pennsylvania State University 01/ 2024

Last Updated 12/ 2024