

Souti Chattopadhyay

GRADUATE STUDENT · HUMAN COMPUTER INTERACTION

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Summary

I work at the intersection of Human-Computer Interaction, Software Engineering and Cognitive Science. My research is centered around designing adaptive human centered tools and interfaces that align with the human cognitive processes when solving problems. I pursue to design better tools by asking questions like how do programmers maintain information when interacting with tools and interfaces? How do the cognitive processes affect programming ability?

My work applies qualitative and quantitative methods, and leverages work on human cognition to (1) understand programmers' needs to interpret complex information to make decisions, (2) identify points where current tools lack in the needed cognitive support, and (3) design interfaces through metaphors that align with human cognition.

Education

Oregon State University

PHD IN COMPUTER SCIENCE

- Advisor: Dr. Anita Sarma
- GPA: 3.6

Oregon, United States

Aug. 2016 - Present

Institute of Engineering and Management (IEM)

B.TECH. IN ELECTRONICS AND COMMUNICATION ENGINEERING

- GPA: 3.65
- Undergraduate Research in Evolutionary Computational Algorithms applied to Patch Antenna

Kolkata, India

June 2012 - July 2016

Experience

Microsoft Research

SOFTWARE ANALYSIS AND INTELLIGENCE (SAINTES) GROUP

With Tom Zimmermann and Denae Ford Robinson, this summer project involved investigating how developers express their identity on social media and community platforms. How does the online identity affect the community, and those beyond the developer community? What are effective ways of interacting with peers and novices seeking advice? We answer some of these questions in our ongoing investigation.

Redmond, Seattle

June 2020 - Sept 2020

Publications

Mag1 Cognitive Biases in Software Development

SOUTI CHATTOPADHYAY, N. NELSON, A. AU, N. MORALES, C. SANCHEZ, R. PANDITA, A. SARMA

Communications of the ACM, Research Highlights (Under Publication)

- Cognitive biases are hard-wired behaviors that influence developer actions and can set them on an incorrect course of action, necessitating backtracking. We conducted a 2-part field study to examine the extent to which cognitive biases occur, the consequences of these biases on developer behavior, and the practices and tools that developers use to deal with these biases.

2022

C7 Developers Who Vlog: Dismantling Stereotypes through Community and Identity

SOUTI CHATTOPADHYAY, DENAE FORD, TOM ZIMMERMANN

CSCW 2021, The 24th ACM Conference on Computer-Supported Cooperative Work and Social Computing (Held Virtually).

- Developers are more than “nerds behind computers all day”, they lead a normal life, and not all take the traditional path to learn programming. However, the public still sees software development as a profession for “math wizards”. To learn more about this special type of knowledge worker from their first-person perspective, we conducted three studies to learn how developers describe a day in their life through vlogs on YouTube and how these vlogs were received by the broader community.

2021

C6 Reel Life vs. Real Life: How Software Developers Share Their Daily Life through Vlogs

SOUTI CHATTOPADHYAY, TOM ZIMMERMANN, DENAE FORD

ESEC/FSE 2021, The ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering, Athens, Greece.

- Software developers are turning to vlogs (video blogs) to share what a day is like to walk in their shoes. However, does the type of activities portrayed in vlogs differ from activities developers in the industry perform? Our findings demonstrate a shift in our understanding of how software developers are spending their time and what they find valuable to share publicly.

2021

C5 Supporting Code Comprehension via Annotations: Right Information at the Right Time and Place

2020

MARJAN ADELI, NICHOLAS NELSON, SOUTI CHATTOPADHYAY, HAYDEN COFFEY, AUSTIN HENLEY, AND ANITA SARMA.

(VL)\HCC 2020, IEEE Symposium on Visual Languages and Human-Centric Computing), Dunedine, New Zealand

- Comprehending code is non-trivial when information is spread across different interfaces and tools. Here, we present an empirical study to investigate how contextualized information help newcomers to reduce the costs of code comprehension using a non-traditional IDE, called Synectic. We found that having the right information at the right time and place leads to increased accuracy and reduced cognitive load during code comprehension tasks, without sacrificing the usability of developer tools.

C4 A Tale from the Trenches: Cognitive Biases and Software Development

2020

S. CHATTOPADHYAY, N. NELSON, A. AU, N. MORALES, C. SANCHEZ, R. PANDITA, A. SARMA

ICSE 2020, 42nd ACM\IEEE International Conference on Software Engineering, South Korea

ACM Distinguished Paper Award 

- Cognitive Biases are patterns of deviation from optimal reasoning. In this mixed methods study we found developer's actions (45.72%) are associated with various cognitive biases, and most of these actions (79.64%) eventually were reversed. We report how these cognitive biases affect developer's decision making and collect various tools and practices that developers think might mitigate the effect.

J1 Mental Models of Mere Mortals with Explanations of Reinforcement Learning

2020

ANDREW ANDERSON, JONATHAN DODGE, AMRITA SADARANGANI, ZOE JUOZAPAITIS, EVAN NEWMAN, JED IRVINE, SOUTI

CHATTOPADHYAY, MATTHEW OLSON, ALAN FERN, AND MARGARET BURNETT.

TiiS 2020, ACM Transactions on Interactive Intelligent Systems, May 2020 Article No.: 15

- How should reinforcement learning (RL) agents explain themselves to humans not trained in AI? To gain insights into this question, we conducted a 124-participant, four-treatment experiment to compare participants' mental models of an RL agent in the context of a simple Real-Time Strategy (RTS) game.

C3 What's Wrong with Computational Notebooks? Pain Points, Needs, and Design Opportunities

2020

S. CHATTOPADHYAY, I. PRASAD, A. Z. HENLEY, A. SARMA, T. BARIK

CHI 2020, ACM\ACM CHI Conference on Human Factors in Computing Systems, USA

SIGCHI Honourable Mention Award 

- Computation notebooks is a popular interactive paradigm for data scientists to explore and analyze. However, with more activities being incorporated into a data scientists' notebooks, they suffer various pain points. Through a mixed methods study we catalog these different pain points data scientists face across the life cycle of the notebooks, and design implications for mitigating the challenges.

C2 Latent Patterns in Activities: A Field Study of How Developers Manage Context

2019

S. CHATTOPADHYAY, N. NELSON, Y. RAMIREZ, A. LEON, R. PANDITA, A. SARMA

ICSE 2019, 41st ACM\IEEE International Conference on Software Engineering, Canada

- Studying developers to identify six distinct patterns of how they decompose and organize their goals into smaller units, and how they manage context across these.

W1 Context in Programming: An Investigation of How Programmers Create Context

2018

S. CHATTOPADHYAY, N. NELSON, T. NAM, M. CALVERT, A. SARMA

CHASE 2018, 11th International Workshop on Cooperative and Human Aspects of Software Engineering, Sweden.

C1 What makes a task difficult? An empirical study of perceptions of task difficulty

2017

R. LEANO, S. CHATTOPADHYAY, A. SARMA

VL/HCC 2017, IEEE Symposium on Visual Languages and Human-Centric Computing, USA

Context in Exploratory Programming: Towards a Theoretical Framework

2017

S. CHATTOPADHYAY

VL/HCC Doctoral Symposium

Skills

- UX Research** Field & User Studies, Interview, Surveys, Qualitative Coding, Mixed Methods, Experimental Design, Statistical Analysis, Log Analysis, Inclusive Design, Heuristic Evaluation, Cognitive Walkthrough, Usability Testing
- Data Analysis** Statistical Testing (Parametric & Non-parametric), Statistical Modelling (Linear, Logarithmic, Nested), Databases, Natural Language Processing (Stemming, Lemmatization, Topic Modelling), Evolutionary Computation, Machine Learning
- Programming** Python, R, Matlab, SQL, C/C++, HTML, CSS, JavaScript

Experience and Service

Graduate Research Assistant (GRA)

ADVISOR: ANITA SARMA

2016 - PRESENT

Proceedings Chair

CHASE 2021

COOPERATIVE AND HUMAN ASPECTS OF SOFTWARE ENGINEERING 2021

Mentor

University of Portland

SATURDAY ACADEMY'S APPRENTICESHIPS IN SCIENCE & ENGINEERING

2018 - PRESENT

Student Volunteer

Gothenburg, Sweden

40TH INTERNATIONAL CONFERENCE ON SOFTWARE ENGINEERING

May 27 - June 3, 2018

Sub-Reviewer

CONFERENCE AND JOURNAL SUBMISSIONS FOR THE FOLLOWING VENUES

2017 - PRESENT

- VL/HCC IEEE Symposium on Visual Languages & Human-Centric Computing, Memphis, Tennessee, USA, 2019
- 33rd IEEE/ACM International Conference on Automated Software Engineering (ASE), Montpellier, France, 2018
- 32nd IEEE/ACM International Conference on Automated Software Engineering (ASE), Urbana-Champaign, Illinois, 2017

Graduate Teaching Assistant (GTA)

Oregon State University

COURSES:

2017 - Present

- CS352 - Intro to Usability Engineering, Spring 2021
- CS569/567 – Laboratory Studies in SE and HCI, Spring 2020
- CS325 - Algorithms (Fall 2016, Winter 2017)
- CS391 - Social and Ethical Issues in Computer Science (Spring 2017)

Presenter/Attendee

EVENTS:

2018 - Present

- ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering
- The 24th ACM Conference on Computer-Supported Cooperative Work and Social Computing
- 43rd International Conference on Software Engineering, Seoul, South Korea, 2020
- 42nd International Conference on Software Engineering, Canada, 2019
- Grad Cohort for Women 2018 Computing Research Association for Women (CRA-W), San Francisco, USA, 2018
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Coursework

Fall 2021	AI534: Machine Learning , Dr. Xiaoli Fern	Dept. of EECS
Fall 2020	ST516: Foundations of Data Analytics , Dr. Yanming Di	Dept. of Statistics
Fall 2020	CS561: Software Engineering Methods , Dr. Kishore Bhamidipati	Dept. of EECS
Spring 2020	CS517: Theory of Computation , Dr. Mike Rosulek	Dept. of EECS
Winter 2020	CS579: Usable Security , Dr. Anita Sarma	Dept. of EECS
Fall 2019	CS515: Algorithms and Data Structure , Dr. Amir Nayyeri	Dept. of EECS
Spring 2019	PSY599: Human Computer Interaction , Dr. Christopher Sanchez	Dept. of Psychology
Spring 2018	CS565: Human Computer Interaction , Dr. Margaret Burnett	Dept. of EECS
Spring 2017	CS560: Empirical Methods of Software Engineering , Dr. Anita Sarma	Dept. of EECS
Spring 2017	ST512: Methods of Data Analysis , Dr. Claudio Fuentes	Dept. of Statistics
Winter 2017	CS569: Empirical Lab Studies of Software Development , Dr. Anita Sarma	Dept. of EECS
Winter 2017	ST511: Methods of Data Analysis , Dr. Sarah Emerson	Dept. of Statistics
Fall 2016	CS519: Research Methods in HCI: Inclusive Design , Dr. Margaret Burnett	Dept. of EECS