Dr. Moushumi Sharmin

Assistant Professor
Department of Computer Science
Western Washington University
516 High Street, Bellingham, WA

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Research Interests

My primary research area is Human Computer Interaction. My current research investigates challenges and opportunities of novel information representation techniques in supporting the vision of P4 Medicine and User-Centered Technology Design, especially for the domain of behavioral health. I am investigating challenges associated with collecting and representing physiological and environmental data utilizing participant-centric design techniques. For my doctoral research, I have investigated representation techniques that assist information reusability, implemented interactive visualization systems for better information management, and demonstrated that novel representations enhances usability.

My recent work investigates representation techniques in supporting privacy-sensitive exploration, analysis, and decision-making of big-data in the domains of behavioral health problems including Autism, Smoking and Drug Addiction, and Stress Management. In addition, I am investigating the role affective and persuasive technology play in supporting long-term health behavior management.

Education

University of Illinois at Urbana-Champaign
Ph.D. in Computer Science (Aug 2013)
Thesis Title: ReflectionSpace: An Interactive Visualization Tool for Supporting Reflection-On-Action in Design
Advisor: Professor Brian P. Bailey

Marquette University
MS in Computer Science (2006)
Thesis Title: A Trust based Secure Resource Discovery Model for Pervasive Computing
Advisor: Professor Sheikh Iqbal Ahamed

Bangladesh University of Engineering and Technology (BUET)
B.Sc. in Computer Science and Engineering (2003)
Thesis Title: Dynamic Programming Based Optimal Algorithm for DNA Strand Alignment
Advisor: Professor Muhammad Masroor Ali

Grants-Awards-Honors

Senior Personnel, Center of Excellence for Mobile Sensor Data-to-Knowledge (MD2K), National Institute of Health (NIH), **$10.8 Million**, Grant Number: 1U54EB020404-01, Period: 2014 - 2018

National Institute of Health (NIH) mHealth Scholar, 2014

Best Paper Nomination, ACM Intelligent User Interfaces Conference (IUI), 2012

Saburo Muroga Fellowship, UIUC (2006-2007)

Google Anita Borg Scholarship Finalist (2006)

Fellow, American Association of University Women (2004-2005)

Excellent Teaching Assistant, University of Illinois (2011)

Outstanding Teaching Assistant, University of Illinois (2012)

Grace Hopper Conference Scholarship (2011)

Travel and Accommodation Grant, Microsoft Academic Days, Canada (2005)

Runner Up, Nationwide Programming Aptitude Test, Bangladesh (2001)

Prime Minister's Award for Excellence of Merit, Bangladesh (1996 and 1994)

4th in the order of merit (out of approximately 150,000 students), HSC exam, Bangladesh (1996)

2nd in the order of merit (out of approximately 150,000 students), SSC exam, Bangladesh (1994)

Selected Publications

(Number of Citations:*563* and h-index: *15*)

Journal Articles

1. Peter J. Polack Jr, Shang-Tse Chen, Minsuk Kahng, Kaya De Barbaro, Rahul Basole, **Moushumi Sharmin**, and Duen Horng Chau. Chronodes: Interactive Multi-focus Exploration of Event Sequences, ACM Transactions on Interactive Intelligent Systems (TIIS), 2017.
2. Santosh Kumar, Gregory Abowd, Bill Abraham, Mustafa alAbsi, Gayle Beck, Polo Chau, Tyson Condie, David Conroy, Emre Ertin, Deborah Estrin, Deepak Ganesan, Cho Lam, Benjamin Marlin, Clay Marsh, Susan Murphy, Inbal Nahum-Shani, Kevin Patrick, Jim Rehg, **Moushumi Sharmin**, Vivek Shetty, Ida Sim, Bonnie Spring, Mani Srivastava, and David Wetter. Center of Excellence for Mobile Sensor Data-to-Knowledge (MD2K), *Journal of the American Medical Informatics Association (AMIA)*, 2015. [Citation count: 5]
3. Shameem Ahmed, Sheikh I. Ahamed, **Moushumi Sharmin** and Chowdhury S. Hasan, Self-healing for autonomic pervasive computing, *Autonomic Communication*, 285-307, Springer US, 2009.[Citation count: 24]
4. Sheikh I. Ahamed and **Moushumi Sharmin**, A trust-based secure service discovery (TSSD) model for pervasive computing, *Computer Communications*, 31(18), 4281-4293, Elsevier, 2008.[Impact Factor: 1.08, citation count: 34]
5. Shameem Ahmed, **Moushumi Sharmin**, and Sheikh I. Ahamed, Ubi-App: A Ubiquitous Application using Ubicomp Assistant (UA) Service of MARKS for Universal Access from Handheld Devices, *Universal Access in the Information Society (UAIS)*, 7(4), 273-283, 2008. [Impact Factor: 0.53, citation count: 3]
6. **Moushumi Sharmin**, Shameem Ahmed, and Sheikh I. Ahamed, Design and Implementation of MARKS (Middleware Adaptability for Resource Discovery, Knowledge Usability and Self-healing) Middleware for Pervasive Computing Environments, *Ubiquitous Computing and Communication Journal*, 2(3), 6-15, 2007. [citation count: 2]
7. Shameem Ahmed, **Moushumi Sharmin**, and Sheikh I. Ahamed, ETS (Efficient, Transparent, and Secured) Self-healing Service for Pervasive Computing Applications, *International Journal of Network Security*, 4(3), 271-281, 2007. [citation count: 29]
8. Sheikh I. Ahamed, **Moushumi Sharmin**, Shameem Ahmed, Munirul Haque, and Ahmed J Khan, Design and Implementation of A Virtual Assistant for Health care Professionals Using Pervasive Computing Technologies, *Journal Springer e&i*,123(4), 112-120, 2006. [citation count: 3]
9. Sheikh I. Ahamed, **Moushumi Sharmin**, Shameem Ahmed, Michael J. Havice, and Suresh Anamanamuri, An Assessment Tool for out of Class Learning using Pervasive Computing Technologies, *Information: An Int. Journal*, 8(5), 751-768, 2005. [Impact Factor: 0.36, citation count: 9]
10. **Moushumi Sharmin** and Brian P. Bailey, Online Design Discussion Sites: Emerging Resource for Creative Design, *HCI International*, 219-228, 2011. [Impact Factor: 0.532, citation count: 2]

Conference Articles

11. **Moushumi Sharmin**, Theodore Weber, Hillol Sarker, Nazir Saleheen, Santosh Kumar, Shameem Ahmed, Mustafa al'Absi. Opportunities and Challenges in Designing Participant-Centric Smoking Cessation System, *IEEE COMPSAC*, 2017.

12. Md. Monsur Hossain, **Moushumi Sharmin**, and Shameem Ahmed. Understanding the Feasibility of a Location-Aware Mobile-Based 911-like Emergency Service in Bangladesh, *IEEE COMPSAC*, 2017.
13. Hillol Sarker, Matthew Tyburski, Md. Mahbubur Rahman, Karen Hovsepian, **Moushumi Sharmin**, et al. Finding Significant Stress Episodes in a Discontinuous Time Series of Rapidly Varying Mobile Sensor Data, *ACM CHI*, 4489-4501, 2016. [Acceptance Rate: 22%, citation count: 6]
14. **Moushumi Sharmin**, Andrew Raij, David Epstien,Inbal Nahum-Shani, Gayle Beck, Sudip Vadhuri, Kenzie Preston, and Santosh Kumar, Visualization of Time-Series Sensor Data to Inform the Design of Just-In-Time Adaptive Stress Interventions, *ACM UbiComp*, 505-516, 2015. [Acceptance Rate: 22%, citation count: 5]
15. **Moushumi Sharmin** and Santosh Kumar, Visualization to Aid Stress Management, *GHC*, 2015.
16. Shameem Ahmed and **Moushumi Sharmin**. Why do mobile phone-based smoking cessation interventions struggle and how can we make them more effective?, *ACM iConference*, 2015. [Acceptance Rate: 36%]
17. Hillol Sarkar, **Moushumi Sharmin**, et al. Assessing the Availability of Users to Engage in Just-in-Time-Intervention in the Natural Environment, *ACM UbiComp*, 909-920, 2014. [Acceptance Rate: 21%, citation count: 22]
18. Sudip Vhaduri, Amin Ahsan Ali, **Moushumi Sharmin**, Karen Hovsepian, and Santosh Kumar, Estimating Drivers' Stress from GPS Traces, *Automotive User Interfaces and Interactive Vehicular Applications (AutomotiveUI 2014)*. [citation count: 3]
19. Md. Mahbubur Rahman, Rummana Bari, Amin Ahsan Ali, **Moushumi Sharmin**, et al. Are We There Yet? Feasibility of Continuous Stress Assessment via Physiological Sensors in Field, *ACM BCB*, 2014.[Citation count: 15]
20. **Moushumi Sharmin** and Brian P. Bailey, ReflectionSpace: An Interactive Visualization Tool for Supporting Reflection-on-action in Design, *ACM Creativity and Cognition (C&C)*, 83-92, 2013. [Acceptance rate: 25%, citation count: 3]
21. **Moushumi Sharmin**, Lawrence Bergman, Jie Lu, and Ravi Konuru, On Slide-Based Contextual Cues for Presentation Reuse, *ACM Intelligent User Interfaces (IUI)*, 129-138, 2012 **(Best Paper Nomination)**. [Acceptance rate: 23%, citation count: 18]
22. **Moushumi Sharmin**, Brian. P. Bailey, Cole Coats and Kevin Hamilton, Understanding Knowledge Management Practices for Early Design Activity and Its Implications for Reuse, *ACM CHI*, 2367-2376, 2009. [Acceptance rate: 25%, citation count: 32]
23. **Moushumi Sharmin** and Brian P. Bailey, Making Sense of Communication Associated with Artifacts during Early Design Activity, *Interact*, 181-198, 2011. [Acceptance rate: 27.6%, citation count: 5]
24. Ed De Guzman, **Moushumi Sharmin** and Brian P. Bailey, Should I Call Now? Understanding What Context is Considered When Deciding Whether to Initiate Remote Communication via Mobile Devices, *Graphics Interface*, 143-150, 2007. [Acceptance rate: 41%, citation count: 44]
25. **Moushumi Sharmin**, Shameem Ahmed, Sheikh I. Ahamed and Haifeng Li, SSRD+: A Privacy-aware Trust and Security Model for Resource Discovery in Pervasive Computing Environment, *IEEE COMPSAC*, 67-70, 2006. [Acceptance rate: 13%, citation count: 16]
26. **Moushumi Sharmin**, Shameem Ahmed and Sheikh I. Ahamed, An Adaptive Lightweight Trust Reliant Secure Resource Discovery for Pervasive Computing Environments, *IEEE PerCom*, 258-263, 2006. [Acceptance rate: 8.21%, citation count: 54]
27. **Moushumi Sharmin**, Shameem Ahmed and Sheikh I. Ahamed, Ubicomp Assistant: an Omnipresent Customizable Service using MARKS, *ACM SAC*, 1013-1017, 2006.

28. **Moushumi Sharmin**, Shameem Ahmed, and Sheikh I. Ahamed, SAFE-RD (Secure, Adaptive, Fault Tolerant, and Efficient Resource Discovery) in Pervasive Computing Environments, *International Conference on Information Technology (ITCC)*, 271-276, 2005. [citation count: 48]

Patent

29. Lawrence Bergman, Ravi Konuru, Jie Lu, and **Moushumi Sharmin**, In-context display of presentation search results, *US Patent App. 13/370,868*, 2012. [citation count: 1]

Workshop Articles and Poster Presentations

30. Ted Weber, Shameem Ahmed, and **Moushumi Sharmin**, Opportunities and Challenges in Designing Participant-Centric Smoking Cessation Systems, Grace Hopper Conference, 2017. (Accepted and Selected as a participant in the ACM Student Research Competition (ACM SRC))**Recipient of Outstanding Undergraduate Poster 2017**
31. Md Monsur Hossain, Serena Bowen, Jonathan Mooneyham, **Moushumi Sharmin**, and Shameem Ahmed, NAAP: A Prevention Strategy Using Mobile App and Wearable Devices, Grace Hopper Conference, 2017. (Accepted and Selected as a participant in the ACM Student Research Competition (ACM SRC))
32. Nova Ahmed, Shameem Ahmed, and **Moushumi Sharmin**, Appropriation and Influence of Facebook in Young Adults in Bangladesh, Grace Hopper Conference, 2017. (Accepted)
33. Frederick M Hohman, Peter J. Polack Jr, **Moushumi Sharmin**, and Duen Horng Chau. mHealth Visual Discovery Dashboard, UbiComp 2017 (under review)
34. Ella Ordona, Rimika Majumdar, and **Moushumi Sharmin**, Towards Using Technology to Reduce Harassment in Online Social Media, *Western Washington University Scholar's Week*, May 2016. **Recipient of Outstanding Undergraduate Poster 2016**
35. Rimika Majumdar, Ella Ordona, Shameem Ahmed, and **Moushumi Sharmin**, Towards Reducing Harassment in Social Media, *Western Washington University Scholar's Week*, May 2016.
36. Peter J Polack Jr, Shang-Tse Chen, Minsuk Kahng, **Moushumi Sharmin**, and Duen Horng Chau, TimeStitch: Interactive multi-focus cohort discovery and comparison, *IEEE Conference on Visual Analytics Science and Technology (VAST)*, 209-210, 2015. [Citation count: 3]
37. Farzana Ahmed Siddique, Nafisa Anzum, Nova Ahmed, and **Moushumi Sharmin)**, Looking for a Possible Solution Approach for Safe Social Networking: A Perspective of Bangladesh, *Grace Hopper Celebration Of Women In Computing (GHC)*, 2015.
38. **Moushumi Sharmin** and Brian P. Bailey, "I Reflect to Improve My Design" - Investigating the Role and Process of Reflection in Creative Design, *Extended Abstract and Poster in ACM Creativity and Cognition*, 389-390, 2011. [Citation count: 2]
39. **Moushumi Sharmin** and Brian P. Bailey, Making Sense of Artifact Reusability in Early Design, *Artifacts in Design: Representation, Ideation, and Process Workshop, ACM CHI*, 2010.
40. **Moushumi Sharmin**, Brian P. Bailey and Karrie Karahalios, An Interactive Visualization Framework for Exploring and Reflecting on Interaction in Online Social Networks. *Extended Abstract and Poster in ACM CSCW*, 2008.
41. **Moushumi Sharmin**, Sheikh I. Ahamed and Shameem Ahmed, A Risk-aware Trust Based Secure Resource Discovery (RTSRD) Model for Pervasive Computing, *Workshop on Web and Pervasive Security of PerCom*, 590-595, 2008. [citation count: 7]
42. **Moushumi Sharmin**, Shameem Ahmed, Sheikh I. Ahamed, Munirul Haque and Ahmed J Khan, Healthcare Aide: Towards a Virtual Assistant for Doctors, Patients, Nurses and Resident Doctors Using Pervasive Middleware, *PerCom Workshop*, 490-495, 2006. [citation count: 29]

Invited Talks

Human-Centric Design to Address Behavioral Health Problems, Invited Keynote, HCSC Symposium, IEEE COMPSAC 2016, June 12, 2016.

Human-Centric Interactive Visualization of Information, George Mason University, May 5, 2015.

Human-Centric Interactive Visualization of Information, Department of Human-Centered Computing, IU School of Informatics and Computing, April 16, 2015.

Human-Centric Interactive Visualization of Information, Department of Computer Information and Graphics Technology, Purdue School of Informatics and Computing, March 10, 2015.

Human-Centric Interactive Visualization of Information, Department of Computer Science,Western Washington University, Jan 22, 2015.

HCI and Design, Department of Computer Science,Western Washington University, Jan 23, 2015.

Supporting Information Reappropriation, School of Engineering, University of Alaska Anchorage, July 1, 2013.

Reappropriation, Reflection, Visualization, and HCI, Computer Science and Information Systems, Texas A&M University - Commerce, April 14, 2014.

Supporting Reappropriation of Information, Computer Science Department, University of Memphis, Jan 31, 2014.

Interactive Visualization to Support Reappropriation of Information, School of Electrical and Computer Engineering, Purdue University, April 2, 2013.

Supporting Information Reappropriation, School of Engineering, University of Alaska Anchorage, July 1, 2013.

Visualization to Support Reappropriation of Information - Department of Information Systems, New Jersey Institute of Technology, February 20, 2013.

ConReP: Contextual Recommender for Presentation Materials - IBM Thomas J. Watson Research Center, August 17, 2012.

Having it ALL: Balancing Family Life, Research, and Academic Career - Workshop on Women Empowerment through ICT: Higher Studies, Research, and Career, July 2014.

Courses Taught

Instructor (Winter 2017)
Course: Principles of User-Centered Technology Design (CSCI 497H-CSCI 597H)
Department of Computer Science, Western Washington University, Bellingham, WA

Instructor (Fall 2016)
Course: Data Structures (CSCI 241)
Department of Computer Science, Western Washington University, Bellingham, WA

Instructor (Spring 2016)
Course: Principles of User-Centered Technology Design (CSCI 497H)
Department of Computer Science, Western Washington University, Bellingham, WA

Instructor (Winter 2016)
Course: Object Oriented Software Design (CSCI 345)
Department of Computer Science, Western Washington University, Bellingham, WA

Instructor (Fall 2015)
Course: Data Structures (CSCI 241)
Department of Computer Science, Western Washington University, Bellingham, WA

Supervisee

Computer Science, Western Washington University (Fall 2015-current)

Graduate Student

Monsur Hossain (co-supervise with Dr. Shameem Ahmed), Project: Design of Mobile-based real-time physiological feedback system (Expected graduation: Fall 2018)

Undergraduate Student

Theodore Weber, Project: Participant-centric Visualization of mHealth Data to Support Smoking Cessation among Young Adults(Winter 2016 - current, Expected Graduation: Fall 2017)

Blen Desta, Project: Evaluating Efficacy of Participant-centric Smoking Cessation Systems(Fall 2016 -current, Expected Graduation: Spring 2017)

Ryan Wendling, Project: Evaluating Efficacy of Participant-centric Smoking Cessation Systems(Fall 2016 -current, Expected Graduation: Spring 2017)

Serena Bowen, Project: Designing a Web-based Analytics System to Find Patterns in Behavioral Health Data(Winter 2017 - current, Expected Graduation: Fall 2019)

Rosselle Macabata, Project: Designing a Web-based Analytics System to Find Patterns in Behavioral Health Data(Winter 2017 - current, Expected Graduation: Spring 2017)

Ella Ordona, Project: Understanding Harassment in Online Social Networks(Fall 2016 - current, Expected Graduation: Spring 2017)

Rimika Majumdar, Project: Designing to Promote Safe Interaction in the Social Networking Sites (Fall 2016 - current, Expected Graduation: Spring 2017)

Other Teaching Experience

Teaching Assistant (Fall 2011, Spring 2012, Fall 2012)
Course: Introduction to Computing for Engineers and Physical Scientists (CS101)
Department of Computer Science, University of Illinois at Urbana-Champaign

Teaching Assistant (Fall 2010)
Course: Principles of User Interface Design, Implementation, and Evaluation (CS465)
Department of Computer Science, University of Illinois at Urbana-Champaign

Teaching Assistant (Fall 2004, Spring 2005, Fall 2005, Spring 2006)
Courses: Computer Networking, Information Systems Representation, Calculus
MSCS department, Marquette University

Mentoring Experience

Computer Science, University of Memphis (Fall 2013-current)

Graduate Student

Hillol Sarker, Project: Interruption and Availability in Field (Phd, Dec 2016)

Md. Mahbubur Rahman, Project: Designing to Preserve Privacy (PhD, August 2016)

Nazir Saleheen, Project: Privacy Modeling (Expected Graduation: 2018)

Soujanya Chatterjee, Project: Missing Data Analysis(Expected graduation: 2020)

Rummana Bari, Project: Privacy and Burden (Expected graduation: 2017)

Sudip Vhaduri, Project: Modeling drivers' stress from GPS Traces (Graduated in May, 2014)

Undergraduate Student

Jordan Davis, Project: Visualizing Everyday Stress (Graduated in May, 2014)

Computer Science, University of Illinois (Spring 2008 – Fall 2012)

Graduate Student
Qi Chen, MS in Industrial Design, University of Illinois (Spring 2011-Fall 2012, Now at Wolfram)

Undergraduate Student
Max Pappas, CS Senior, Project: Designing to increase energy awareness(Spring 2009- Fall 2010)

Anshul Kanakia, CS Senior, Project: Search beyond text (Spring 2009-Fall 2009)

Kevin Verre, CS Freshman, Project: Next generation idea repository (Summer 2009-Fall 2009)

Coal Coats, CS Senior, Project: Understanding information reuse (Spring 2008-Summer 2009)

CSE, Bangladesh University of Engineering and Technology (Fall 2013-current)
Nafisa Anzum, Project: Privacy in Facebook (Graduated in Spring 2016)

Farzana Raisa, Project: Harassment and Privacy in Facebook (Graduated in Spring 2016)

Service

Judge, Student Research and Poster Competition, Western Washington University (2015)

Member of the Undergraduate Curriculum Development Committee, Western Washington University (2015-current)

Judge, Student Research Competition, University of Memphis (2013)

Member of the Fellowship, Assistantship, and Admissions (FAA) committee, UIUC (2011, 2012)

Graduate Student Academic Council Member, Department of Computer Science, UIUC (2010)

Graduate Application Review Committee Member, Department of Computer Science, UIUC (2009)

Member, Preparing Future Faculty (PFF), Marquette University (2004-2006)

Advisory Board Member, Buetian Women in CSE, BUET (2014-current)

Professional Activities

Program Committee Co-Chair, HCSC: COMPSAC Symposium on Human and Social Computing, COMPSAC 2017

Program Committee Co-Chair, HCSC: COMPSAC Symposium on Human and Social Computing, COMPSAC 2016

Program Committee Member
Work-in-Progress, CHI 2015, 2014, 2011
Interact 2013
Middleware Engineering Workshop 2009 and 2010, COMPSAC 2009 and 2010

Paper Reviewer

CHI (2008 - 2017)	CSCW (2008 – 2010)
UbiComp (2006-2016)	DIS (2010)
Pervasive Health (2013)	PerCom (2006 – 2007)
Creativity and Cognition (2009, 2011)	Interact (2011, 2017)
COMPSAC (2005 – 2010)	iConference (2014)

Employment

Western Washington University (September 2015 –)
Assistant Professor
Department of Computer Science

University of Memphis (August 2013 - September 2015)
Research Assistant Professor
Department of Computer Science

University of Illinois at Urbana-Champaign (August 2007 - July 2013)
Research and Teaching Assistant
Department of Computer Science

IBM Thomas J. Watson Research Center (May 2011 - August 2011)
Research Intern
The Collaborative Technologies and Infrastructure Team

Marquette University (August 2004 - August 2006)
Research and Teaching Assistant
Mathematics, Statistics, and Computer Science Department

Software Engineer and Information Analyst (2001 – 2003)
Advanced Chemical Industries (ACI) Ltd, Dhaka, Bangladesh

Research Projects

Visualization of Continuous Sensory Data for Stress Management
Collaborator: Dr. Santosh Kumar (CS, Univ. of Memphis), Dr. Gayle Beck (Psychology, Univ. of Memphis), Dr. Andrew Raij (CS, Univ. of Central Florida), Dr. Kenzie Preston (NIDA, NIH), Dr. David Epstien (NIDA, NIH)
Designed five novel stress visualization techniques based on an analysis of 1,143,156 data points collected in natural living conditions. The visualizations are grounded in health behavior theory, stress management literature, and existing research on health behavior change. The proposed visualizations are targeted to address the unique challenges posed by stress management such as facilitating identification of patterns in a substantial amount of data collected from the natural environment, aiding the perception of self-efficacy by enabling access to personalized stress profiles, highlighting patterns of stress, and enhancing awareness of context-dependent stressors. The visualizations are evaluated in an exploratory evaluation technique.

Assessing User Privacy Risks Emerging from Wearable Sensors
Collaborator: Dr. Santosh Kumar (CS, Univ. of Memphis), Dr. Mani Srivastava (ECE,UCLA)
Investigated privacy risks associated with collecting and sharing GPS, activity, physiology, and audio data in daily life. We use requested compensation (N=57) as an objective measure of perceived privacy concern. Carrying a phone throughout the day with GPS turned on is our base condition. We find that when smart watch with inertial sensors is added, users ask for 19% more in compensation. Subsequent addition of a chest band with ECG and respiration sensors leads to a steep rise in the requested compensation (i.e., by 45%). When an audio recorder is finally added, participants in our survey show diminishing return effect, as they ask for only 10% more. Our findings inform the selection of wearable sensors in future studies to minimize user burden and privacy issues.

Assessing User Availability in the Field
Collaborator: Dr. Santosh Kumar (CS, Univ. of Memphis)
Wearable wireless sensors for health monitoring are enabling the design and delivery of just-in-time interventions (JITI). Critical to the success of JITI is to time its delivery so that the user is available to be engaged. We proposed a model of users availability by analyzing 2,064 hours of physiological

sensor data and 2,717 self-reports collected from 30 participants in a week-long field study. We used delay-in-responding to a prompt to objectively measure availability. We computed 99 features and identified 30 as most discriminating to train a machine learning model for predicting availability. We report that location, affect, activity type, stress, time, and day of the week, play significant roles in predicting availability. Our model finally achieves an accuracy of 74.7% in 10-fold cross-validation and 77.9% with leave-one-subject-out.

Development and Evaluation of a Contextual Recommender to Facilitate Reuse of Presentation Materials
Advisor: Dr. Lawrence Bergman, Dr. Jie Lu, Dr. Ravi Konuru (IBM Thomas J. Watson Research Center)
Designed and implemented a slide-based contextual recommender, ConReP, to support reuse of presentation materials. Applied information retrieval techniques to develop models to recommend slides based on their contextual similarity without requiring user provided keywords for the search-task. These models were used to create a local-context-based visual representation of the recommendations. Evaluation of ConReP in a lab-study revealed that slide-based search is more effective than keyword-based search, local-context-based visual representation helps in better recall and recognition, and shows the promise of this general approach of exploiting individual slides and local-context for better presentation reuse. This resulted in US Patent 13/370,868.

Development of a Framework to Facilitate Recall and Recognition of Personal Information
Advisor: Dr. Lawrence Bergman, Dr. Jie Lu, Dr. Ravi Konuru (IBM Thomas J. Watson Research Center)
Performed grounded-theory based data analysis to better understand strategies that users adopt to support recall and recognition of their own materials. Applied behavioral psychology theory coupled with findings from the users' practice to develop a framework for supporting recall and recognition of personal information. This resulted in US Patent 13/370,868.

Exploration of Information management and Reuse practices in the Early Stages of the Creative Design Domains
Advisor: Dr. Brian P. Bailey (University of Illinois at Urbana-Champaign)
Conducted contextual inquiry to collect qualitative data about professional designers' information management and reuse practice. Analyzed interview and observation data to understand how designers store, access, retrieve, and reuse existing design information in the early stages of design. This provided insight into the practices of and attitudes toward knowledge management and reuse during the early stages of design in the creative domains. Our findings were also distilled into actionable implications for the development of knowledge management systems.

Development of Automated Assistant for Mobile Devices
Advisor: Dr. Sheikh Iqbal Ahamed (Marquette University)
Designed and developed Ubicomp Assistant (UA), a customizable service for PDAs, Smartphones, and laptops that provides capabilities such as of secure wireless file transfer, chat, note taking or surveying for different types of users (e.g. conference attendees, pollster, doctors, teachers, students) on the fly.

Development of Virtual Health Care Assistant for Mobile Devices
Advisor: Dr. Sheikh Iqbal Ahamed (Marquette University)
Developed a virtual assistant that supports secure information management and transfer among doctors, nurses, and patients. The UI design was based on qualitative user studies conducted with doctors and patients.

Development of a Middleware for Mobile Devices
Advisor: Dr. Sheikh Iqbal Ahamed (Marquette University)
Designed and developed MARKS, a lightweight middleware that supports Resource Discovery,

Knowledge Usability, and Self-Healing capability for mobile devices. MARKS emphasizes on maintaining privacy and security of mobile devices using lightweight mechanism.

Exploration of Communication Surrounding Artifacts
Advisor: Dr. Brian P. Bailey (University of Illinois at Urbana-Champaign)
Conducted contextual inquiry to collect qualitative data about professional designers' communication practices surrounding artifacts. Our findings show that more than 50% of early design activity consists of three categories of communication (information seeking, brainstorming, and feedback) and communication practice varies as a function of expertise, organizational and social factors. Additionally, our findings provide insight into the evolving nature of communication mediums and different strategies adopted by novice and freelance designers from experts. We found that freelance designers show greater reliance on online forums as opposed to experts who rely on team members (other experts) for information collection and sharing.

Exploring Online Design Discussion Sites as a Resource for Creative Design
Advisor: Dr. Brian P. Bailey, Dr. Assata Zerai (University of Illinois at Urbana-Champaign)
Investigated activities and participation pattern of designers in online design discussion sites aiming to gain a deeper understanding of parameters that influence users' experience with the sites. Findings show that in addition to supporting communication and networking, online discussion sites act as a resource for receiving critique on early design ideas. The difference in activities and communication pattern in these sites from other social networking sites call for novel representation of activities and interaction.

Development of an Automated Visualization Framework for Online Social Networks
Advisor: Dr. Brian P. Bailey, Dr. Karrie Karahalios (University of Illinois at Urbana-Champaign)
Developed an interactive visualization framework based on social networking theory that allows users to explore their history of interaction with online friends. Applied information retrieval techniques to compute closeness of social interaction and utilized this computation to create representation of past interaction. This visual framework allows users to reflect on their online presence, examine interactions with friends, and adjust online behavior as desired. Users construct their own visualization by selecting variables corresponding to interaction traces and how these map to visual dimensions.

References

Available upon request.