

Matthew N. Bonner

matt.bonner@gatech.edu — 248.736.5766

Research Interests: Collaborative Computing, Healthcare, Participatory Design, User Studies, Fieldwork, Nontraditional Users

Education

Georgia Institute of Technology

PhD student, Human-Centered Computing
Advisor: Elizabeth Mynatt

Aug 2008 - present

GPA: 4.0/4.0

University of Michigan

B.S. Computer Science

2004- 2008

GPA: 3.6/4.0

Peer-Reviewed Publications

[R1] **Bonner, M.**, Wang, L., Mynatt, E. (2012). Activity-Based Interaction: Designing with Child Life Specialists in a Children's Hospital. In Proceedings of the thirtieth Annual SIGCHI Conference on Human Factors in Computing Systems. CHI '12. Austin, TX. (in press).

[R2] **Bonner, M.**, Brudvik, J., Abowd, G., Edwards, K. (2010). No-Look Notes: Accessible Eyes-Free Multi-touch Text Entry. In Proceedings of the eighth International Conference on Pervasive Computing. Pervasive '10. Helsinki, Finland.

[R3] Shi, X., **Bonner, M.**, Adamic, L. A., & Gilbert, A. C. (2008). The very small world of the well-connected. In Proceedings of the nineteenth ACM conference on Hypertext and hypermedia (pp. 61-70). Pittsburgh, PA, USA: ACM. (**Best Paper Award**)

Posters

[P1] **Bonner, M.**, Brudvik, J., Edwards, K. (2009) No-look notes: eyes-free mobile text entry using multitouch gestures. Poster presented at Computing at the Margins Symposium 2009. Atlanta, GA, USA.

[P2] **Bonner, M.**, Brudvik, J., Jeong, H., Mohamed, H., Abowd, G. (2009). MEW: Coping with pediatric transplants. Poster presented at Ubicomp 2009 conference. Orlando, Florida, USA.

[P3] Brudvik, J., **Bonner, M.**, Mohamed, H., Abowd, G. (2010). RAT: Running Apart Together. Poster presented at Georgia Tech Research and Innovation Conference. Atlanta, GA, USA.

[P4] Kim, T., Jeong, H., Chew, Y., **Bonner, M.**, Stasko, J. Social Visualization for Micro-Blogging Analysis. (2009). Poster at VisWeek 2009. Atlantic City, New Jersey, USA.

Research Experience

Predictive Health and Online Health Seeking

Jan 2010 - present

Georgia Institute of Technology, Emory Predictive Healthcare Institute

Advisor: Elizabeth Mynatt

Keywords: Collaborative Computing, Fieldwork, Healthcare, Participatory Design, User Studies

We are working with the Emory Predictive Healthcare Institute to study how health providers and their clients find, share and act on online health information. This research addresses fundamental collaborative computing topics, such as how diverse users delegate authority and access, engage in information seeking and sensemaking activities and transform data for sharing.

I am using a Participatory Design approach to develop an online tool, part web-app and part browser extension, for use by Predictive Healthcare Health Partners and their clients. We are beginning with focus groups of both Partners and clients and shadowing of Partner-client consultations. Work will continue with development of our tool, pilot testing and interviewing with partners and clients, and finally a longitudinal deployment at the Predictive Healthcare campus.

Activity-Based Interactions: Designing for Child Life Specialists

Jan 2008 - Oct 2011

Georgia Institute of Technology, Children's Healthcare of Atlanta

Advisor: Elizabeth Mynatt

Publications: [R1, P2]

Keywords: Collaborative Computing, Fieldwork, Healthcare, Nontraditional Users, Participatory Design, User Studies

This project explored how Child Life Specialists (CLS's) are able to adapt activities and systems to the different personalities, medical conditions, emotional states and cognitive abilities of children in the hospital. We developed several versions of MEW, a handheld tool that allows users to scan tagged objects to retrieve information and play games. After evaluating MEW and some comparators, we introduced "Activity Based Interactions" (ABI) as a means of understanding how systems shape and are shaped by CLS-child encounters. ABI highlights system components that exist across extremely different tools, allowing us to compare and understand their performance as more collaborative or more co-present. Our work's conclusions are relevant to traditional collaborative computing researchers studying nontraditional users and articulation work, as well as those studying design for children.

Initial work (P2, advised by Gregory Abowd) developed a MEW prototype using the Nintendo Wii. For this phase, I worked with a team of peers to interview CLS's and other health professionals, design and develop MEW, and perform pilot testing with CLS's. After a project hiatus, I supervised several junior students as we completely re-developed two versions of MEW as an iOS system based both on our past work and new focus groups with CLS's and hospital walkthroughs. I evaluated our new systems, along with comparators, at Children's Healthcare for Atlanta with CLS's and their patients (R1).

RAT: Running Apart Together

Oct 2009 - Jan 2010

Georgia Institute of Technology

Advisor: Gregory Abowd

Publications: [P3]

Keywords: Collaborative Computing, Mobile Computing

RAT is a social exercise infrastructure comprising networked iPhones each connected to a custom haptic feedback accessory. We developed RAT, Running Apart Together, to help users that are physically or temporally separated enjoy some of the benefits of jogging with a group. This work is relevant to developers of exergames and exertion interfaces, as well as to researchers studying remote collaboration.

I worked with a group of peers to design and develop RAT, primarily focusing on networking between the phones. The accessory and motors are integrated into an exercise armband, placed on the upper arm. The motors are evenly distributed around the armband: one in the front, one in the back, and two on each side. RAT leverages each iPhones' built-in sensors to communicate information about each user's status, such as pace or distance covered, to the rest of the group via motor pulses.

Clearspace
Georgia Institute of Technology

Sept 2008 - Jan 2010

Advisor: Blair MacIntyre

Keywords: Collaborative Computing, Virtual Worlds, Mixed Reality

This project studied distributed teams, a classic topic for collaborative computing researchers. Clearspace is a mixed reality tool that relies on the Java-based Wonderland virtual world toolkit and a custom large display “portal”. The movements of users in the virtual and physical worlds are matched to avatars, creating a shared space and preserving some of the benefits of co-located work. Our primary research goal was to explore the viability of mixed reality as a tool for remote collaboration, using only low-cost, publicly available materials rather than prohibitively expensive, one-off systems or instrumented rooms.

I personally focused on creating tools for the ‘portal’, primarily a scalable vector graphics whiteboard application. Development was in Java, and used both the Wonderland toolkit and the Batik SVG library. I was supervised both by my advisor and by a post-doctoral researcher, who led the project.

No-Look Notes: Accessible, Multi-touch Text Entry
Georgia Institute of Technology, Atlanta Center for the Visually Impaired

Oct 2008 - Oct 2009

Advisors: Keith Edwards, Gregory Abowd

Publications: [R2, P1]

Keywords: Mobile Computing, Nontraditional Users, Text Entry, User Studies

Touchscreens present a featureless, smooth surface that is difficult or impossible for visually impaired people to use. At the same time, touchscreens have gained prominence as devices like self checkouts and smartphones proliferate. No-Look Notes (NLN) makes entering text on touchscreens accessible to visually impaired users by using multi-touch gestures and audio feedback.

I worked with a peer to create a pilot system (P1) which was pilot tested with visually impaired users prior to creating our final system. Both the final version of NLN and a publicly distributed system for touchscreen accessibility were evaluated by a within-subjects study (R2). This study included qualitative and quantitative evaluations in collaboration with the Center for the Visually Impaired in Atlanta.

Social Visualization for Micro-Blogging Analysis
Georgia Institute of Technology

Jan 2008 - Apr 2008

Advisor: John Stasko

Publications: [P4]

Keywords: Information Visualization, Social Networks

Online social networking sites such as Twitter and Facebook encourage people to share their status in real time. Although these self-reported messages are unstructured and ‘noisy’, they are an extremely direct window into the lives of millions of users. Twitter as online word of mouth can provide opinions about products, services, or systems. We implemented “Tweetsters”, a program that allows users to explore this information. Tweetsters is a multi-view interactive visualization displaying trends over time, localization of specific keywords, and allows for comparison between keywords.

I worked with a team of peers to design and develop Tweetsters. I was primarily responsible for our app’s ‘under the hood’ functionality: collecting and searching tweets and preparing search results for our visualization tool.

Graph Compression with Important Vertices

Jan 2007 - Apr 2008

University of Michigan

Advisor: Lada Adamic

Publications: [R3]

Keywords: Graph Theory, Social Networks

Our research addressed the problem of studying extremely large online networks. Networks such as the links between blogs or instant messaging 'buddy lists' are important disseminators and repositories of information, but their sheer scale makes analyzing or even examining these networks extraordinarily difficult. Using well defined properties of nodes from graph theory, such as betweenness and centrality, we created and analyzed more manageable subgraphs of the highest-rated 'important' nodes. Our datasets (largest: 150,000+ nodes, 1.5+ million links) included both random graphs and real world networks, including a web-crawl and links between blogs.

I participated in the project as an undergraduate assistant researcher. I was responsible for running some of the analysis of our data, primarily using the R statistical package and Python, as well as writing the corresponding portions of our paper.

Work Experience

Virtual Worlds Intern

May 2009 - Aug 2009

Sun Microsystems - Sun Labs (Santa Clara, CA)

I was an intern on the Project Wonderland team. Wonderland is an extensible open-source 3D virtual world toolkit written entirely in Java. I created a module for Wonderland that allows users to apply searchable tags to virtual objects, which was managed by an LDAP database. I also developed a module that demonstrated this system's power, allowing users to create searchable 'annotations' that were visible in-world. Finally, I worked with a large group of developers during a "week of code" to create a "3D timeline module" that demonstrated some of Wonderland's new features.

Website Design and Development

Jun 2008 - Aug 2008

University of Michigan - Center for Sustainable Systems (Ann Arbor, MI)

I worked as a freelancer with a partner to redesign, update and implement a complete new website for the Center for Sustainable Systems. The site was developed using Drupal, a PHP-based open-source content management system. We worked with a graphic designer and Center for Sustainable Systems personnel. Extensive documentation for users and future developers was also developed, along with cross-browser compatibility work.

Website Development and Maintenance

Apr 2006 - Sep 2006

University of Michigan - Computer Aided Engineering Network (Ann Arbor, MI)

I worked with other team members to develop and manage the University of Michigan College of Engineering website. I developed new sections of site and modified and maintained existing pages. Via a bugtracking/ticketing system, we also dealt with daily requests and feedback from college faculty, staff, administrators and students. The site was built using Zope, a Python-based open-source content management system.

Skills

Languages: C, C++, CSS, HTML, Java, Javascript, Objective-C, Python, French

Libraries/Tools: iOS, Java Swing, JQuery, Drupal, Flex, Photoshop, Subversion, XCode

Fieldwork: Focus groups, shadowing, surveys, user evaluations, interviewing, participatory design

Service and Teaching

TA: User Interfaces Software, Human-Computer Interaction, Issues in Human Centered Computing (all at Georgia Tech)

Reviewing: CHI '12, Mobile HCI '11

Volunteering: Children's Healthcare of Atlanta (Art and Activities cart) Fall '10-Present, CHI '10