Evidence and Inquiry Certificate

Information Interfaces and Friction

"We are constantly interacting with information, but the exchange is rarely without friction. Our eyes stumble over certain printed words, or wander and become disoriented while navigating software. We may take an incorrect action as a result, mispronouncing a word or clicking on the wrong item. Somehow, the interface, the thing that we are using to retrieve or modify the information, gets in the way..."

Nicholas Walker

Natural Sciences

Computer Science

⬤ *Describe your field of study. What are some of the questions you would like to answer, and what academic disciplines do you think will be useful in answering them?*

We are constantly interacting with information, but the exchange is rarely without friction. Our eyes stumble over certain printed words, or wander and become disoriented while navigating software. We may take an incorrect action as a result, mispronouncing a word or clicking on the wrong item. Somehow, the interface, the thing that we are using to retrieve or modify the information, gets in the way. I propose to study how this friction within the information interface leads to errors. I will focus on visual interfaces, taking courses in fields directly concerned with preventing interaction errors, like human-computer interaction and information studies. Additional courses may come from fields that study how humans handle these errors, like psychology and cognitive science. Other perspectives may come from courses on the history of information technologies, but I am primarily interested in modern practice and problems.

As computation influences more interfaces, human-computer interaction increasingly finds itself concerned with a broader set of interactions. Where a computer used to be limited to keyboard input, it now has sensors that register motion and other ambient actions so that it may better understand what we are doing without explicit instruction. Computers understand users and the environment in entirely new ways, allowing them to tailor the presentation of information to better suit any given situation. This recent shift makes it worthwhile to reexamine other classes of interaction. We may take inspiration from the ways other interactions have been designed, or we may learn of new ways that computation will come to assist other fields. Inquiry in this area could uncover more effective ways of communicating information. This could lead to productivity gains, something of near universal interest.

Many interesting topics exist within this field. For instance, in disciplines that rely on interactions with highly structured information, like music with notes on a staff, positive outcomes depend on the practitioner's ability to negotiate between the stored information and their mental models. Despite the diversity of contexts in which music might appear, its traditional presentation formats are largely fixed. How might these different contexts demand modifications to the way we visually present the information? Can we dynamically determine the best interface, perhaps by examining the errors that the user makes?

⬤ *Why are you interested in studying this topic?*

If humans were endowed with an extraordinary capacity for discernment, some sort of telepathy that allowed us to communicate without error, societies would look very different. Learning would be easier and interpersonal relationships would be less complex. We would be more connected in our understanding of each other and of the world. Without this flawless communication though, we're bound by the information interfaces we have. We speak through them, embedding our thoughts inside of them and hoping that others will get from them something close to what we put in. This exchange has friction for all parties though, and the resulting interaction is something less than magical.

I have realized that many of my interests, like writing or user interface design, are essentially practices in this process of embedding information. I think I'm drawn to the uncertainty.

They're loosely steered by principles that suggest what will be most effective, but we can only know if an idea will work by testing it. So we build and discard, write and rewrite, trying to capture what we want to say in its truest representation. At every step we get a little closer, and at the end we have a fantastic reward; a distilled version of some thought, suspended in the medium we are working with, imperfect but useful. It's slow moving and often frustrating, but the constant search for solutions and the goal of communicating are deeply compelling.

As a computer science student and a native of the information age, it's natural for me to be curious about how new technologies can augment the ways we communicate and interact with information. We have an abundance of new sensors and displays with which to fight friction, ways for computers to compensate for our lack of telepathy. In pursuing this field, I will be studying the intersection of all of my fascinations. I will exercise my skills as a software engineer, study the way people interact with the world of information that surrounds them, and, hopefully, build something that inches us closer to a world of more supernatural, more magical interactions.

☐ *Name two faculty with research interests in your area. Include their home departments*
☐ *and relevant research interests. If a research interest isn't obviously related to your*
☐ *topic, explain its relevance.*

Edison Thomaz
School of Information
Ubiquitous computing, human computer interaction, machine learning

Jacek Gwizdka
School of Information
Search interfaces, human computer interaction, cognitive psychology

◉ *Explain how each course is relevant to this field. What do you hope to learn from each?*

☐ *Primary Courses*

INF 350E   **Principles of Interaction Design**

This course provides an introduction to the thought processes and considerations required when designing interactions. It attempts to convince a technically minded audience of the importance of testing ideas with actual users, and equips students with the tools and language to analyze interactions.

INF 380E   **Perspectives on Information**

This class consists mostly of readings and presentations on the various ways that scholars have critically examined information. It will provide an essential introduction to the discourse of the area, as well as an introduction to important topics like cognition and metadata.

LAH 350   Book Technologies

This course surveys the history of the book, the technologies used to produce books, and the tools that authors use to create them. It takes a broad view, attempting to place the book and written expression in the context of other forms of communication. I hope to gain insight into how technological change has shaped the course of the book and the printed word, one of the longest lived forms of mass communication.

INF 385P   Usability

This course argues for the importance of user-focused design and teaches fundamental usability engineering methods with a focus on web design. In addition to discussion of the scientific underpinnings of usability, the course presents concrete case studies to illustrate common design failures. I hope to learn about principled means of creating or improving the usability of interfaces.

INF 385C   Human-Computer Interaction

This class covers the essential theories of human-computer interaction and teaches design thinking as a method of approaching interactions. Though positioned as an introductory course, this course has a valuable focus on a semester-long team project. I hope to gain experience working on applied interaction problems in a team setting.

INF 385G   Advanced Usability

The core of this class is a large, independent project in usability testing. Students go through the process or testing a web interface on human subjects. I hope to gain practice in the evaluation of interfaces and the process of getting this type of research approved by the university.