
Anticipating the Future of HCI by Understanding Its Past and Present

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ABSTRACT

This course is for students, practitioners, and academics who are interested in planning their careers. The rapid pace of change leaves some tools and technologies behind. We must focus our attention primarily on current developments. Why look in the rear-view mirror? Some topics that are being actively explored now will soon be of less interest, so career planning benefits from thoughtfully identifying trajectories. To make use of relevant information in other fields you must understand how their terminologies, priorities, and methods evolved. We will cover the history of several HCI fields and discuss opportunities and challenges that lie ahead.

Software evolved from passively reacting to human input to today's dynamic partnership. In some areas HCI advanced steadily, elsewhere it reached dead ends or seemed to go in circles. Understanding these patterns will prepare you to respond to unexpected developments in years to come.

The forces that shaped HCI in computer science, human factors, information systems, information science, and design are covered, with examples and implications for our new era.

CCS CONCEPTS: • Human-centered computing → **HCI theory, concepts and models**;
• Social and professional topics → **History of computing**; Historical people; History of hardware;
History of Software

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KEYWORDS

HCI; History; Future; Design; AI; Human Factors; Information Systems; Information Science

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1 BENEFITS OF UNDERSTANDING HCI HISTORY IN PLANNING FOR THE FUTURE

In the last fifteen years, many more people adopted digital technologies to support more activities. Mobile computing went from a minor presence to a dominant one. Social media that were a casual activity of thousands of people are now used heavily by billions. Computing became integral to almost all disciplines and industries. Visual design rose in prominence, then data science, machine learning, and conversational user interfaces.

Human-computer interaction has been a research focus in human factors, computer science, information systems, information science—and now it is salient in more fields. These efforts did not merge. Each field developed its own terminologies, priorities, and methods, impeding communication across them. One goal of learning about the past is to identify the forces that shaped each field, giving you insight into what it could have to offer that might be useful. Another goal is to use the trajectories and repeating patterns of the past to gauge what could happen next. A third is to see that unexpected dead ends can impact careers. We should be alert and confident, avoiding overconfidence or complacent trust that what is effective now will remain so.

We have entered a new world for HCI. Until ten or fifteen years ago, HCI focused on realizing visions that were set out before 1970. It took longer than expected, but it was accomplished. As we chart new paths, the history can reveal patterns that may recur. It can reveal the risks of working in only one discipline in a dynamically evolving field—and the challenges in bridging disciplines.

My interest in history developed when I was surprised at the difficulty of learning from fields engaged in related work. I was puzzled that some CHI topics that seemed foundational were largely abandoned. I noticed that certain technologies were strongly embraced and then dropped every ten years or so. Major research efforts were left behind when the field changed direction. I tracked down and spoke with people who had lived through the changes. My goal is to enable experienced researchers, designers, and developers to see the past in a new light, and those with less experience to navigate future adventures more smoothly than we did.

2 COURSE STYLE AND CONTENT

My slides are primarily timelines, quotations, and illustrations. I start with some examples and questions set in the present before working through the past. When we reach considerations of what the future might hold, I don't have a crystal ball, but I can identify some good bets and will be interested in a group discussion.

I conducted the historical research in the process of writing articles and chapters that appeared in *Annals of the History of Computing*, *AI Magazine*, *CACM*, *IEEE Computer*, and several handbook chapters. I wrote and edited a column on HCI history for *Interactions* magazine for several years. In 2017, I published a Morgan & Claypool book *From Tool to Partner: The Evolution of Human-Computer Interaction*. The book's table of contents is on the next page. The course now starts at the end, with examples that illustrate important questions facing human-computer interaction today.

Then the course reviews the history through different time periods, focusing on the disciplines most relevant at each time. At the end, we can return to the questions at the outset with a more informed perspective.

Materials: My papers are available at jonathangrudin.com and many universities have a site license for my Morgan & Claypool book.

The intended audience is anyone looking for a perspective on how their work might fit into HCI broadly defined—students, faculty including those teaching or interested in an HCI overview, and other researchers, developers, designers. The course is not an engineering history focusing on who did what when, nor is it a theoretical or conceptual history tracing the evolution of interface objects or methods. It examines how different fields contributed over time to HCI, what they have focused on, and how and why they did or did not interact. It presents patterns that emerged in work within and across fields.

3 COURSE OUTLINE

As described above, the course will start by illustrating issues that we face today, then travel back in time and describe HCI work that informed and was carried out in several fields, not only computer science where CHI has been central but also human factors, information systems, and more recently information science, with discussion AI, design, and other contributors. This will follow the outline of my book, the table of contents of which is on the next page. At the end we will return to a group discussion of the present.

FROM TOOL TO PARTNER: THE EVOLUTION OF HUMAN-COMPUTER INTERACTION

[**Jonathan Grudin, Morgan & Claypool, 2017**](#)

- 1. Preamble: History in a Time of Rapid Change**
- 2. Human-Tool Interaction and Information Processing at the Dawn of Computing**
- 3. 1945–1955: Managing Vacuum Tubes**
- 4. 1955–1965: Transistors, New Vistas**
- 5. 1965–1980: HCI Prior to Personal Computing**
- 6. Hardware Generations**
- 7. 1980–1985: Discretionary Use Comes into Focus**
- 8. 1985–1995: Graphical User Interfaces Succeed**

**9. 1995–2005: The Internet Era Arrives and Survives
a Bubble**

10. 2005–2015: Scaling

11. Reflection: Cultures and Bridges

12. A New Era

13. Conclusion: Ubiquitous HCI

Appendix: Personal Observations