6724 Special Topic in HCI: Research Through Design (Fall 2017)

SUMMARY
This class is seminar on the special topic of research through design (or "RtD"). RtD has become a legitimate form of HCI research in the past decade. Individual students will be assigned to lead the discussion. As discussion leader, each will be expected to do more extensive research. Students will also conduct a research-through-design project; the write-up will be targeted to appropriate conferences on RtD. This course has a number of complementary objectives: introduce design thinking, explore the uses and limits of various RtD methodologies, locate RtD with respect to more traditional HCI research approaches and values.

BACKGROUND
Research Through Design is a research approach that has been gaining legitimacy in the HCI community for the past decade. In RtD, designers produce novel integrations of HCI research in an attempt to make the *right* thing: a product that transforms the world from its current state to a preferred state. This model allows designers to make research contributions based on their strength in addressing under-constrained problems. [24, 21] The basic idea is that instead of studying a new interaction technique for its own sake, that by imagining and deploying a new artifact or system, the entirety – including the context – can be evaluated.

The roots of RtD actually pre-date the invention of personal computing. Harley Earl, chief designer for GM in the mid-20th Century, used design as a means to engage with potential customers and internal GM decision-makers through the creation of "concept cars". Concept cars invoked futuristic imagery to highlight new technological features. The cars were holistic propositions about future generations of GM products. They would be shown at car shows along with the latest models; Earl and his associates would informally interact with attendees to assess how they understood the car and its features. Earl would complement this market probe by driving concept cars to the Gross Pointe Country Club where GM executives regularly gathered. In that setting, he would gather feedback about the design and, just as importantly, see how the executives understood the concept car to see if it aligned with what the public would say about them at car shows.

The role of design in HCI practice gained prominence when Apple began to use it as a market differentiator. Because of the persistent gulf between research and practice, design has not been a significantly acknowledged source of technological innovation, nor has it been an approach to research with "first class status". For those familiar wth the history of HCI (as explored in 5724, for example), quantitative methods, mostly derived from information theory and cognitive psychology, have dominated research, driving out the possibility of design thinking-based approaches. While these quantitative methods have proved a useful engineering tool, they have not provided a source of innovation or of re-conceptualization.

(Curiously, one of most significant roots of personal computing, Douglas Englebart's work on augmentation using his NLS system — also known as "the Mother of All

Demos" — is a prime example of a research through design approach. [1] It pre-dated the cognitive psychology approach to understanding interactive technology; Englebart got pushed aside in HCI research as those quantitative methods gained primacy.)

But the tide of design has begun to re-shape research. First there has been categories of design submission at conferences and then conferences devoted to designing interactive systems. Finally, using design as a research approach got a few key proponents willing to work to convince the field that they were making contributions to the field. Since the terminology "research through design" has gained acceptance in HCI about a 10 years ago, various approaches have emerged: probes, cultural probes, critical design, autobiographical research, annotated portfolios, and future fiction.

COURSE DESCRIPTION

This class is seminar on the special topic of research through design (or "RtD"). Students will research and present in seminar on selected topics; they will also conduct a research-through-design project, with the write-up targeted to appropriate conferences on RtD.

Some possible topics include:

- Design thinking [8]
- Reflective practice
- Design research [9]
- Market probes
- Cultural probes [22]
- Genre design
- Critical design [9]
- Autobiographical research [19]
- Annotated portfolios [10]
- Future fiction [3]

The output from the semester project is intended to be a conference paper. Some target conferences are ACM Design of Interactive Systems, Research Through Design biannual conference, and the Design Research Conference.

STUDENTS

While this is nominally an HCI course (and therefore targeted at CS and ISE students focussing on human-computer interaction), this course should be of interest to those interested in how design works in relation to research. Thus, students in the Human-Centered Design program, for example, are encouraged to take this course to further develop design thinking skills as well as think more deeply about the nature of research. Students in non-HCI parts of CS are encouraged to enroll to get a feel for how HCI practitioners think about innovation.

While there is no pre-requisite, having taken HCI Models and Theories (CS 5724) would provide some background. For those who have, this course will feel like a specialized continuation of it.

EVALUATION

Evaluation will be broken down as follows:

15% class participation (and this really does mean speaking up as well as doing the short design exercises)

20% leading assigned discussions
45% Project and paper
5% Written design feedback
15% review and comments on readings (written)

Grading for the course is based on the distribution of credit shown in the table. Final letter grades for the course will be determined using the following grading scale, based on the percentage of possible points achieved:

A >= 93% A->= 90%
B+ >= 87% B >= 83% B->= 80%
C+ >= 77% C >= 73% C->= 70%
D+ >= 67% D >= 63% D->= 60%
F < 60%

SYLLABUS

We will begin by doing a couple of short design thinking projects during the first two weeks. These will be followed in short order with student-led seminars drawn from this list of topics:

Topics:

- Design thinking [8]
- Reflective practice
- Design research [9]
- Market probes
- Cultural probes [22]
- Genre design
- Critical design [9]
- Autobiographical research [19]
- Annotated portfolios [10]
- Future fiction [3]

There will be two presentations of semester projects: A mid-project design review where students will provide extensive design feedback and a final presentation of the research that resulted from the design.

POLICIES

Assignment submissions

Homework and project reports are due by class time (5:00 PM) on the due date. Ten percent (10%) of the maximum grade will be deducted for each day an assignment is late, up to a maximum of three days; weekends count as two days. Check each assignment description for details on submission.

Attendance

Attendance at all classes is important for students to succeed in this course. Please show respect for the instructor and the other students by arriving on time and prepared. Attendance is required for the in-class activities, and this will be part of your grade in the course.

Honor Code

The Undergraduate Honor Code pledge that each member of the university community agrees to abide by states:

> "As a Hokie, I will conduct myself with honor and integrity at all times. I will not lie, cheat, or steal, nor will I accept the actions of those who do."

Students enrolled in this course are responsible for abiding by the Honor Code. A student who has doubts about how the Honor Code applies to any assignment is responsible for obtaining specific guidance from the course instructor before submitting the assignment for evaluation. Ignorance of the rules does not exclude any member of the University community from the requirements and expectations of the Honor Code.

1. All assignments submitted shall be considered "graded work" and all aspects of your coursework are covered by the Honor Code. All projects and homework assignments are to be completed individually unless otherwise specified. Group (or team) projects are to be completed by members of the group only.

2. Commission of any of the following acts shall constitute academic misconduct. This listing is not, however, exclusive of other acts that may reasonably be said to constitute academic misconduct. Clarification is provided for each definition with some examples of prohibited behaviors in the Undergraduate Honor Code Manual located at https://www.honorsystem.vt.edu/

A. CHEATING
   Cheating includes the intentional use of unauthorized materials, information, notes, study aids or other devices or materials in any academic exercise, or attempts thereof.

B. PLAGIARISM
   Plagiarism includes the copying of the language, structure, programming, computer code, ideas, and/or thoughts of another and passing off the same as one's own original work, or attempts thereof.

C. FALSIFICATION
   Falsification includes the statement of any untruth, either verbally or in writing, with respect to any element of one's academic work, or attempts thereof.

D. FABRICATION
   Fabrication includes making up data and results, and recording or reporting them, or submitting fabricated documents, or attempts thereof.

E. MULTIPLE SUBMISSION
   Multiple submission involves the submission for credit—without authorization of the instructor receiving the work—of substantial portions of any work (including oral reports) previously submitted for credit at any academic institution, or attempts thereof.

F. COMPLICITY
   Complicity includes intentionally helping another to engage in an act of academic misconduct, or attempts thereof.

G. VIOLATION OF UNIVERSITY, COLLEGE, DEPARTMENTAL, PROGRAM, COURSE, OR FACULTY RULES

The violation of any University, College, Departmental, Program, Course, or Faculty Rules relating to academic matters that may lead to an unfair academic advantage by the student violating the rule(s).

Special Needs

If you have any special needs or circumstances (disability accommodations, religious holidays that will cause you to miss class, etc.) please feel free to visit the instructor during his office hours.

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