

Human-Computer Interface

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School of Software Engineering
Tongji University

Today's Topics

- Course Introduction
- What is HCI?
- From the Software Engineering Perspective

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- *Course Introduction*
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Course Information

- Schedule
 - Every Monday
 - Class 3-4 / Class 5-6
 - Week 1 to 17
- Location
 - 安楼A308/A208
- Office hours
 - 16:30-17:30, Tuesday

Course Information

- Theory
- Lab & Discussions
- Presentations



Who I am

- Instructors



Shuang LIANG
梁爽

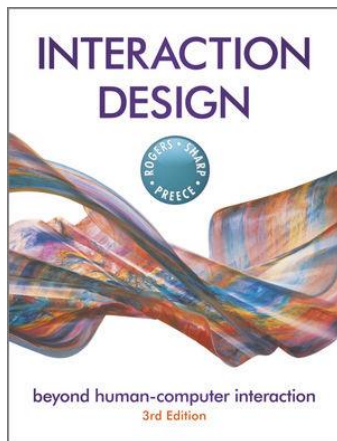
- Teaching Assistants
 - TBA...
 - Please resort to TA for all programming issues

Who I am

- Dr. Shuang LIANG
 - Associate professor, SSE, Tongji
 - Education
 - B.Sc in Computer Science, Zhejiang University, 1999-2003
 - PhD in Computer Science, Nanjing University, 2003-2008
 - Visit in Utrecht University, The Netherlands, 2007, 2008
 - Research Fellowship
 - The Chinese University of Hong Kong, 2009
 - The Hong Kong Polytechnic University, 2010-2011
 - The City University of Hong Kong, 2012
 - Contact
 - Office: Room 314, Jishi Building, Jiading Campus
 - Email: shuangliang@tongji.edu.cn
 - Tel: 69585491

Materials

- The course slides
- Reference materials
- Texts



Yvonne Rogers, Helen Sharp, Jenny Preece, *Interaction Design: Beyond Human - Computer Interaction*, 3rd Edition, John Wiley & Sons, April 2011



人机交互——软件工程视角
骆斌编，机械工业出版社出版，
2012年12月

Grading Policy

- Class participation 10%
 - Please do NOT be absent for more than 5 times, otherwise you will fail. 5%
 - Being active in class 5%
- Labs x 4 40%
 - Co-work by 2 people
- Project 50%
 - Teamwork by 4 people
- Plagiarism is not allowed!

Grading Policy

Projects

- A group formed by 4
- Open HCI topic
- 4 successive people on the student namelist

Important dates

- Project proposal
 - Around week 9 (4.17)
 - Proposal presentation (开题)
- Finals
 - Around week 17 (6.12)
 - Project presentation (答辩)

Course Materials

- Server Samba:
 - [\\10.60.41.1](#)
- Folder
 - “用户交互技术_梁爽”
- Assignments submission
 - To TA
 - To be assigned

Today's Topics

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- *What is HCI?*
- From the Software Engineering Perspective

What is HCI?

- *“Human-computer interaction is a discipline concerned with the design, evaluation and implementation of interactive computing systems for human use and with the study of major phenomena surrounding them.”*

-- ACM SIGCHI 1992

What is HCI?

- *“Human-computer interaction is a discipline concerned with the **design, evaluation and implementation of interactive computing systems** for human use and with the study of major phenomena surrounding them.”*

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What is HCI?

- Number of other terms used emphasizing what is being designed, e.g.
 - user interface design
 - software design
 - user-centered design
 - product design
 - web design
 - experience design (UX)
 -
- *HCI is the umbrella term covering all of these aspects*
 - fundamental to all disciplines, fields, and approaches concerned with researching and designing computer-based systems for people

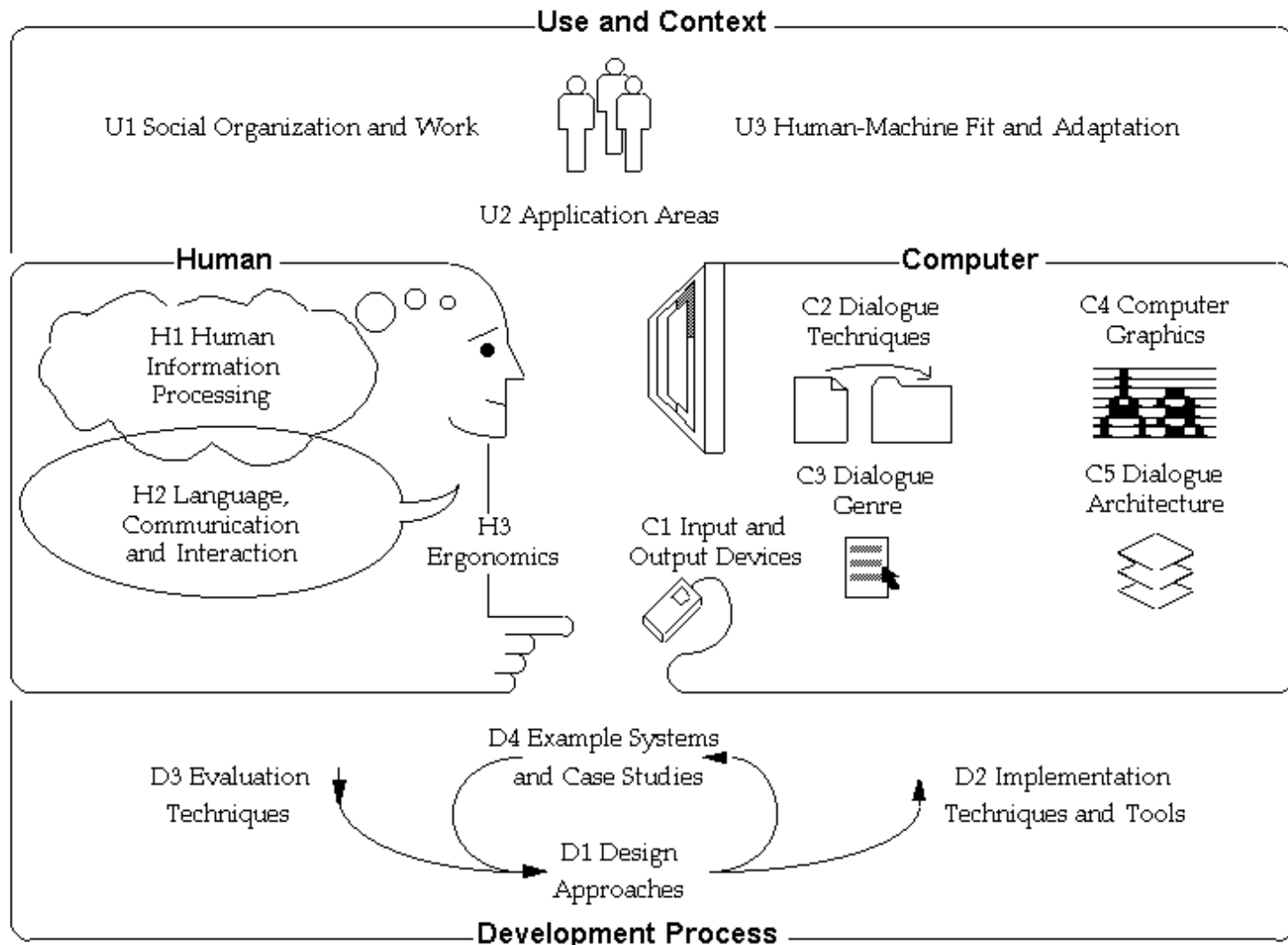
The Content of HCI

- N The Nature of HCI
 - N1 (Meta-)Models of HCI
- U Use and Context of Computers
 - U1 Human Social Organization and Work
 - U2 Application Areas
 - U3 Human-Machine Fit and Adaptation
- H Human Characteristics
 - H1 Human Information Processing
 - H2 Language, Communication, Interaction
 - H3 Ergonomics
- C Computer System and Interface Architecture
 - C1 Input and Output Devices
 - C2 Dialogue Techniques
 - C3 Dialogue Genre
 - C4 Computer Graphics
 - C5 Dialogue Architecture
- D Development Process
 - D1 Design Approaches
 - D2 Implementation Techniques
 - D3 Evaluation Techniques
 - D4 Example Systems and Case Studies

The Content of HCI

abstract

High-level



concrete

Low-level

Which Kind of Design?

- Computing systems
 - Computer
 - Mobile phone
 - Microwave
 - Remoter
 - Elevator
 -



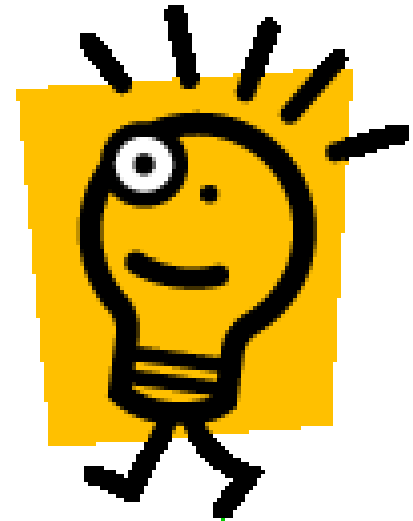
Why HCI is Important?

- The study of our interface with information
- Not just
 - “*how big should I make buttons*”
 - “*how to layout menu choices*”
 -
- It affects
 - Effectiveness
 - Productivity
 - User experiences
 - Cost

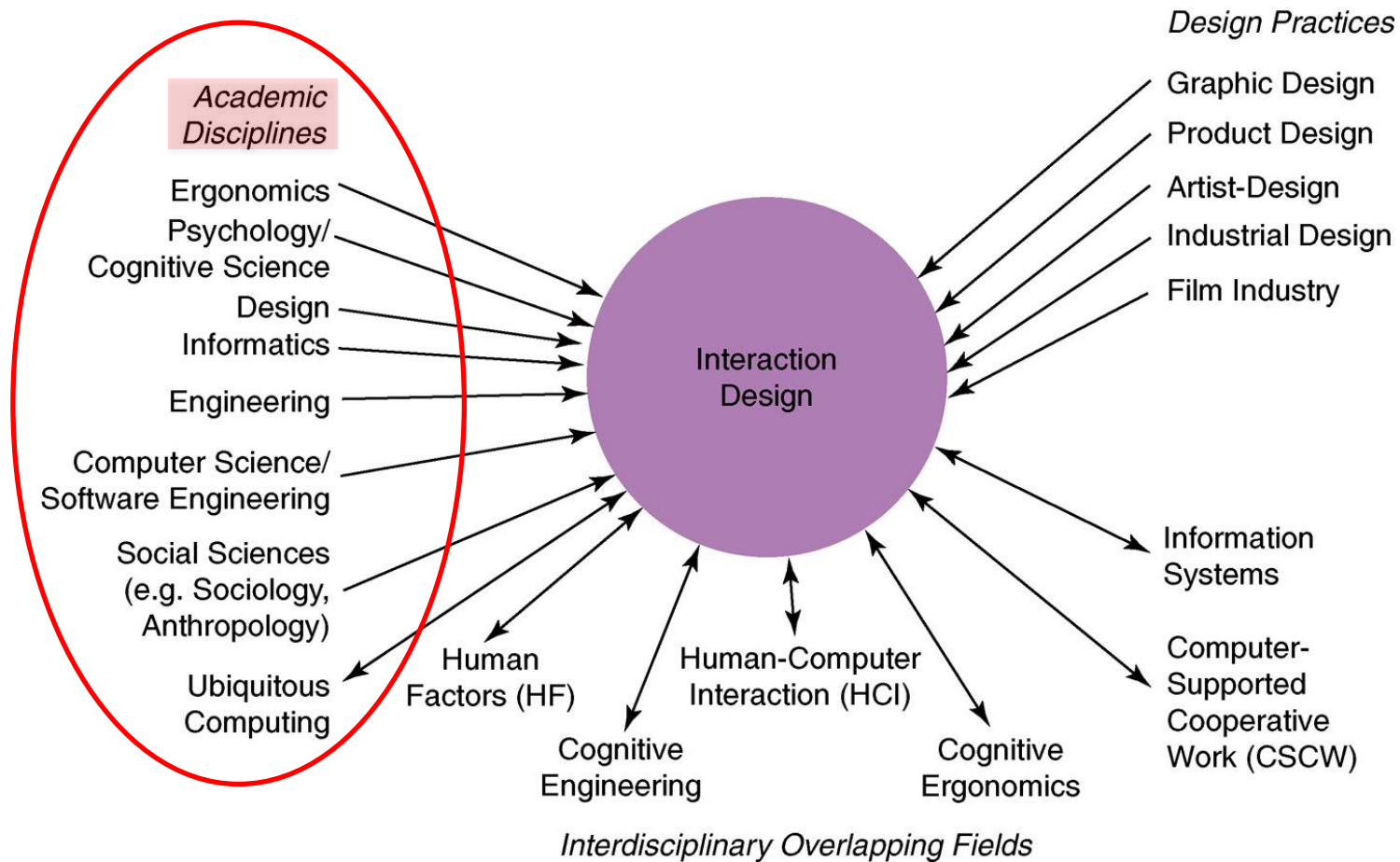


Related Areas

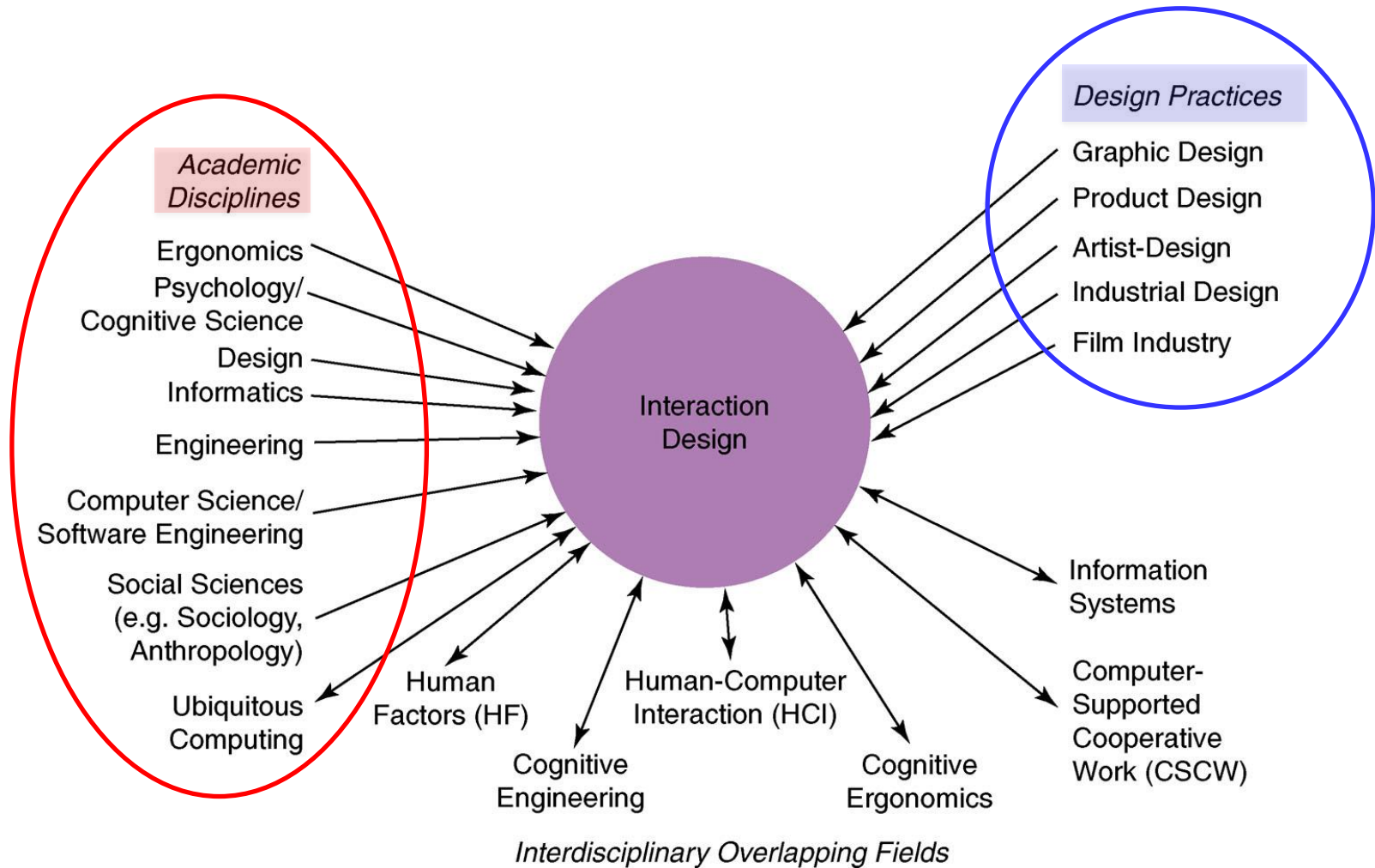
- Graphic Design
- Product Design
- Software Engineering
- Cognitive Science
- Information Systems
-
- How are they contribute to HCI?



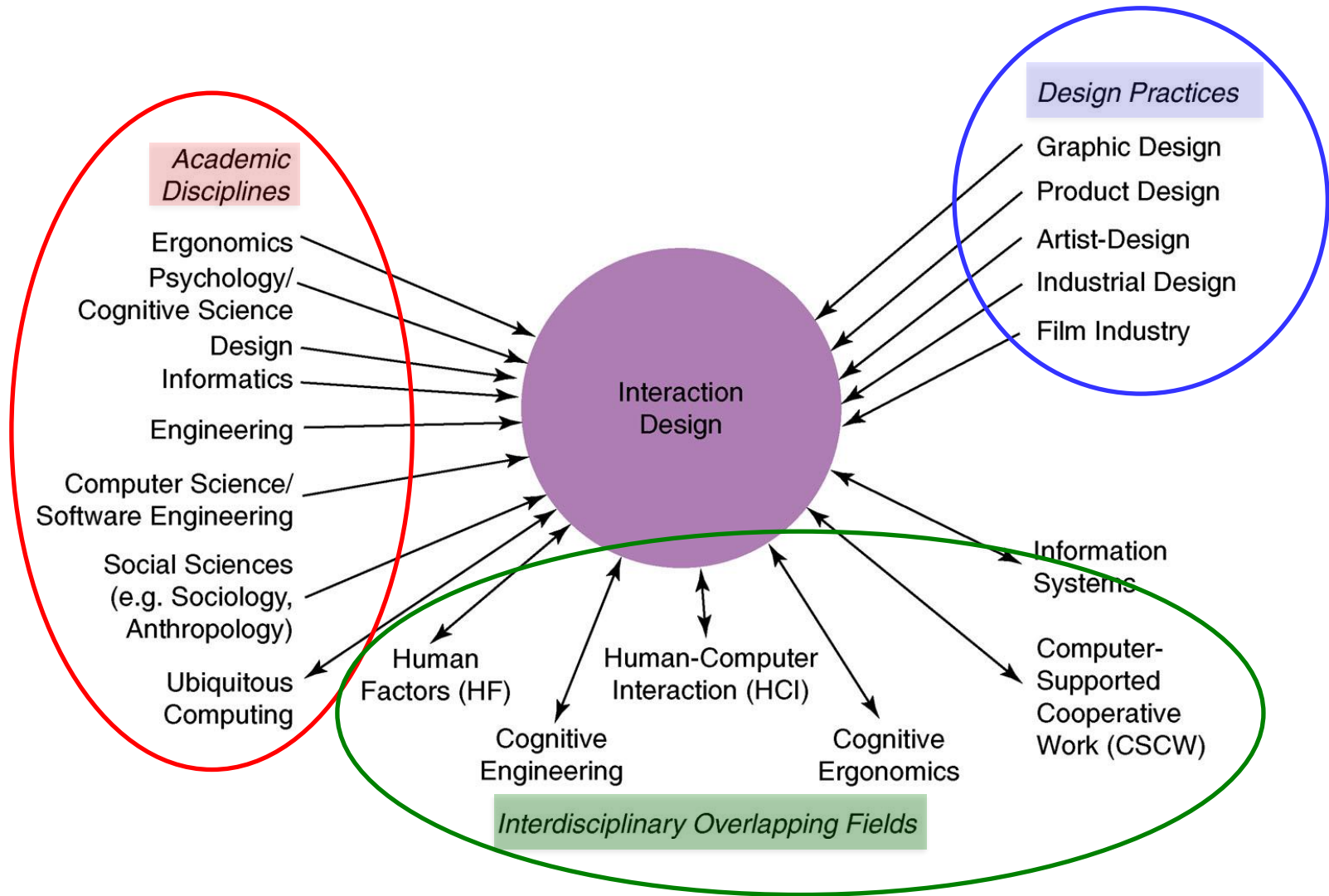
Related Areas



Related Areas



Related Areas



Related Areas

HCI = Engineering + Psychology

Working in multidisciplinary teams

- Many people from different backgrounds involved
 - Different perspectives and ways of seeing and talking about things
- Benefits
 - more ideas and designs generated
- Disadvantages
 - difficult to communicate and progress forward the designs being create



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HCI and SE: Distinctions

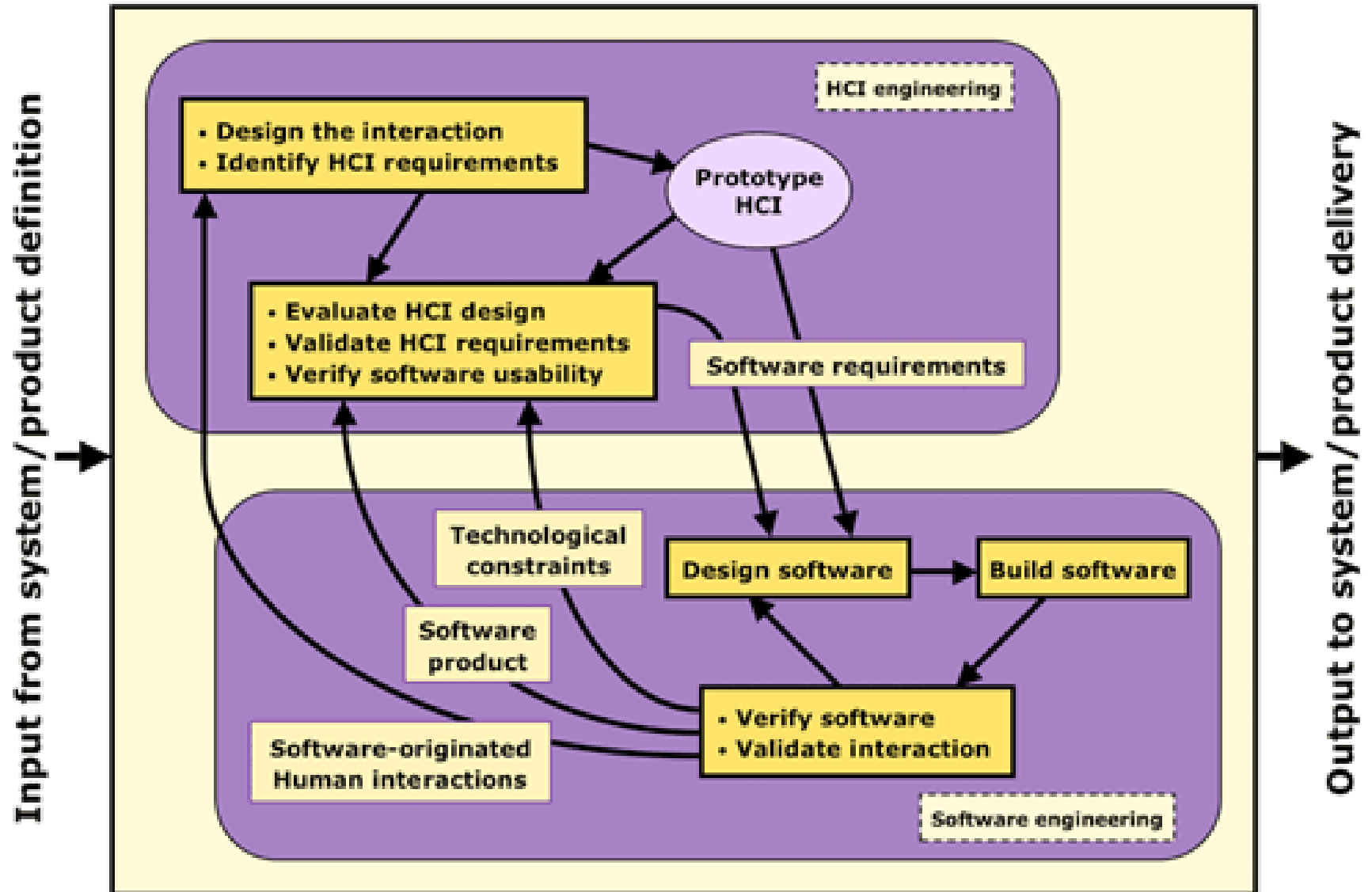
HCI Engineering (keeper of the user view)

- User task analysis
- Usability specification
- Interaction architecture/design
- Interface design/specification
- Software support identification
- Usability evaluation

Software Engineering (keeper of the technology view)

- Software requirements analysis
- Software design
- Interface software coding
- Interaction support software coding
- Application program coding
- Software verification/validation

HCI and SE: Cooperation



What's YOUR role?

- Who are involved in software development?
 - Interaction designer, Visual designer, Programmer
- In reality, programmers often cover interface design
 - HCI-trained people build better interfaces
 - Required knowledge in SWEBOK 3.0
 - One of the 25 most important techniques for software programmers

**Your role:
Towards a more integrated way!**

Professional vision

- Interaction designers
 - people involved in the design of all the interactive aspects of a product
- Usability engineers
 - people who focus on evaluating products, using usability methods and principles
- Web designers
 - people who develop and create the visual design of websites, such as layouts
- Information architects
 - people who come up with ideas of how to plan and structure interactive products
- User experience designers (UX)
 - people who do all the above but who may also carry out field studies to inform the design of products

Course Outline

- Fundamentals
 - Conceptualization
 - Design principles
 - Interface design process
 - Prototyping
 -
- Hands-on design labs

What is not covered in this course?

- iOS/macOS development
- User interface development
- GUI programming with C++/Qt
- We only focus on *design, prototyping, and evaluation* aspects in this course!
- Implementation is encouraged!

Course Requirements

- Prerequisites
 - Graphic Design
 - Artist Design
 - C++ Programming
- Something you may need to learn off-class
 - Design practices
 - Cognitive Science
 -

Goals

- Musts
 - Understand design principles of user interface
 - Analyze existing UI design according to design principles
 - Apply design principles to design good user interface
 - Justify design and development decisions
- Optional
 - Implement user interface with programming (Qt/C++/...)
 - Extend UI development knowledge to other platforms

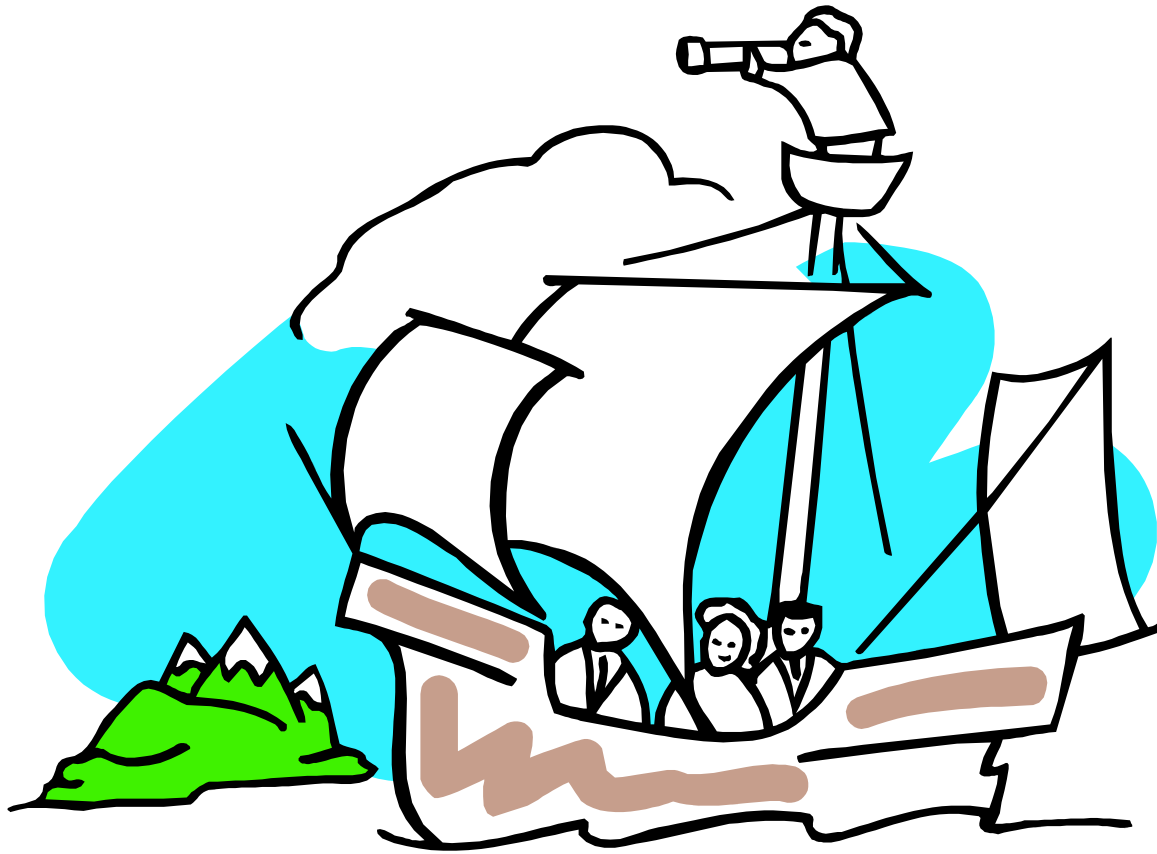
What Capabilities can be Improved in this Course?

- Design analysis
- Summarizing ability
- Working Attitude
- Team working
- Communication
- Presentation
- Expression



Class Group chat

- Course Group
 - WeChat
- Rename as
 - “studentID-name”



Let's start this journey!