Wisdom is not the product of schooling but the lifelong attempt to acquire it.
- Albert Einstein

Mega-Creativity

Gerhard Fischer and Hal Eden
Fall Semester 2008

Creativity as a Topic before in the Course

Beyond Binary Choices: Integrating Individual and Social Creativity

Gerhard Fischer and Hal Eden
Fall Semester 2008, October 8

The Basic Message

- Individual **versus** Social Creativity → Individual **and** Social Creativity

  "The strength of the wolf is in the pack, and the strength of the pack is in the wolf."  
  Rudyard Kipling

- **why:** the **complexity** and **uniqueness** of design problems transcends the unaided, individual human mind → it requires **social creativity**
Research in Creativity

- **a timely and hot topic**

- **workshop** supported by the National Science Foundation, June 2005

- **conference** “Creativity & Cognition”, June 2007

- **new program** “CreativeIT: Creativity and IT”; National Science Foundation (2007) → [http://swiki.cs.colorado.edu:3232/CreativeIT](http://swiki.cs.colorado.edu:3232/CreativeIT)
Problem: The Rope around the Earth

- There is a steel ring around the earth at the equator touching the (flat) earth everywhere. We extend the steel ring by 1 yard in length and form a concentric circle around the earth (i.e., the distance between earth and steel ring is the same everywhere)

- **Question:** Will a small cat be able to sneak through between the earth and the steel ring?
Problem: How Old are the Children

- A person visits a family with 3 children and would like to know the ages of the children. The mother tells the visitor:
  - “Their ages multiplied with each other is 36.
  - Their age added is equal to the number on the house.”
  → The visitor goes in front of the house and looks at the number (and she knows now the number).
  - She comes back and says: “I still do not know the age of the children.”
  - The mother then tells her: “The oldest son plays the piano”.
  - Now the visitor knew the age of the children.

- Question: How old are the children? (note: the ages of all children are integers!)
Leonardo da Vinci as an Inspirational Source for Creativity

- his work spanned many disciplines
- thirst for understanding diverse knowledge domains
- willingness to take on ambitious projects
Shneiderman: Three Schools of Creativity

- inspirationalists
- structuralists
- situationalists
Inspirationalists: Great “Ahas” for Dramatic Breakthroughs

- famous examples:
  - Archimedes (3rd century before BC): “Eureka” (weight of water displaced is equal to the weight of the object which displaces it)
  - Kekule (19th century): ring structure of benzene → a snake biting its tale

- inspiration + hard work:
  - “luck favors the prepared mind”
  - Edison: “1 percent inspiration and 99 percent perspiration”
Kekule: dream of whirling snakes \(\rightarrow\) the structure of benzene

- Interesting for Creativity:
  - the non-conscious state in which it is alleged to have occurred
  - the "remote" analogy
Inspirationalists: Techniques And Tools

- brainstorming, fee association, and divergence

- software: encourage 2-D Layouts of loosely connected concept nodes
  - IdeaFisher
  - MindMapper
Structuralists

- emphasize more orderly approaches
- stress the importance of studying previous approaches
- methods of problem solving (George Polya)
  - understand the problem
  - devise a plan
  - carry out the plan
  - look back
- software:
  - libraries and Web sites of previous work
  - spreadsheets
  - simulations
  - visualizations
Situationalists

- emphasize intellectual, social, and emotional contexts
- role of collaboration
- feedback from communities

Mihaly Csikszentmihalyi
  - domain = disciplines
  - field = people who act as gate keepers to the domain
  - individual contributors = come up with new ideas + selected by the field
    + inclusion in the relevant domain

software:
  - previous work in the domain
  - critiquing
  - rewards for accomplishments
Level of Creativity

- everyday
- evolutionary
- revolutionary

- psychological versus historical

- Shneiderman’s goal: mega-creativity = to enable more people to be more creative more of the time
A Framework for Creativity
(based on chapter 5)

- **collect** → learn from previous works (stored in libraries, on the Web, in other people’s mind) → question: pull versus push

- **relate** → consult with peers and mentors

- **create** → explore, compose evaluate possible solutions

- **donate** → disseminate the results (stored in libraries, on the Web, in other people’s mind) → question: pull versus push
The 1200 Help Desk People at IBM

Broadcast: Information Overflow of Decontextualized Information
The Challenge: To say the ‘right’ thing at the ‘right’ time in the ‘right’ way to the ‘right’ persons
Ben Shneiderman’s Eight Specific Tasks

1. **searching** and browsing digital libraries, the Web, and other resources

2. **visualizing** data and processes to understand and discover relationships

3. **consulting** with peers and mentors for intellectual and emotional support

4. **thinking** by free association to make new combinations of ideas

5. **exploring** solutions — what-if tools and simulations models

6. **composing** artifacts and performances step by step

7. **reviewing** and replaying session histories to support reflection

8. **disseminating** results to gain recognition and add to the searchable resources
Processes in Agentsheets (A. Repenning, Nov 10)

1) Build
2) Share
3) Locate
4) Take
5) Comprehend
6) Modify
Visual AgenTalk
The FishTank — Created by a Community Using the Behavior Exchange
More about Social Creativity


- “Linux was the first project to make a conscious and successful effort to use the entire world as a talent pool” → Raymond, E. S. & Young, B. (2001) The Cathedral and the Bazaar: Musings on Linux and Open Source by an Accidental Revolutionary, O'Reilly & Associates, Sebastopol, CA.
Spring Semester 2009: Design, Creativity and New Media

CSCI 4412 taught jointly with CSCI-5412

- This course will explore the design of new media and technologies to support design and creativity. It will analyze design and creativity as human activities of fundamental importance in the networked information culture and economy. It will provide theoretical and practical analysis of new media.

- Prerequisites: Consent of instructor or CSCI 3002 / CSCI 7000-003.