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

Building New Worlds Together:
—
Meta-Design and Social Creativity

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Acknowledgements

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- colleagues and friends at the Center for LifeLong Learning & Design (L3D), Computer Science Department, and Institute of Cognitive Science at CU

- thanks to all of you who came tonight (including many friends who are not “computer people”)
Outline

- basic message
- meta-design
- social creativity
- research challenges
Basic Message
Building New Worlds Together
(Designing the Future Together)

- while “Bowling communities” are on the decline → new communities are forming:
  - Facebook,
  - Flickr and YouTube,
  - Second Life,
  - Wikipedia,
  - 3D Warehouse

- create an analytic framework to understand these new communities:
  - meta-design = design for designer
  - social creativity = to transcend the limitations of the individual human mind

- the new Web (Web 2.0 technologies) — harness collective intelligence and social creativity
  - from broadcast to participation
  - all people can become active contributors in personally meaningful problems
Local Collaborations

University

Boulder County

The LOCAL Collaboration

Google

City of Boulder
CU’s Flagship 2030

Serving Colorado, Engaged in the World

- Flagship 2030 charts a new course for the University of Colorado at Boulder
  - Leverage our comprehensive and national position to take a leadership role in higher education
  - Collaborate with others in the state to achieve greater success in our collective mission for Colorado
Examples of Local Collaborations: Creating “Win-Win” Situations

- **Google and CU**
  - *Google employees* participating in courses at CU
  - *CU students* hired by Google modeling CU Campus in 3D
  - *Google research awards* (Clayton Lewis and Jim Martin)

- **City / County / CU / Google**
  - *Project Spectrum: SketchUp for Autistic Children* (Anja Kintsch, Tom Wyman, and Chris Cronin) → see:
    - YouTube Movie: [http://www.youtube.com/watch?v=k7PlwSnKq7E](http://www.youtube.com/watch?v=k7PlwSnKq7E)


  - *Envisionment and Discovery Collaboratory* (Hal Eden and Ernesto Arias)
Question from UC Davis Student (Nov 12, 2007)

I read an online article today about the use of 3D drawing programs by children on the autism spectrum, and am very interested in obtaining more information about any research that is in progress that concerns this topic.

The Center for Lifelong Learning and Design at the University of Colorado at Boulder was listed as the institution involved with this research.

I am a doctoral student at the University of California at Davis in Human Development and my focus is on interventions for children with autism.

If there is any way that you can connect me with any resources that are related to this line of research, it would be incredibly helpful to me.
Community of Soundscapes

- Sounds are used to engage local communities in the **interpretation** and **management** of their urban and natural environment.
Global Collaboration: Social Production and Mass Collaboration in Web 2.0 Environments
A Transformational Framework

- established frameworks $\rightarrow$ frameworks for the future
- school learning $\rightarrow$ lifelong learning
- unaided individual human mind $\rightarrow$ distributed intelligence
- consumers $\rightarrow$ active contributors (meta-design)
- learning when the answer is known $\rightarrow$ learning when no one knows the answer (social creativity)
Beyond the Unaided, Individual Human Mind
Meta-Design = Design for Designers

- **meta-design explores:**
  - a culture in which participants can **express themselves** and engage in personally meaningful activities

- **meta-design requires**
  - designers giving up some **control** at design time
  - **active contributors** (and not just passive consumers) at use time

- **meta-design raises research problems of fundamental importance**
  including
  - new **design methodologies**
  - a new understanding of **collaboration, motivation, and creativity**

- **meta-design provides a theoretical framework for **Web 2.0 technologies**
What Do Meta-Designers Do?

- they use their own creativity to create socio-technical environments in which other people can be creative
  - by creating contexts and content creation tools rather than content
  - by creating technical and social conditions for broad participation in design activities
  - by supporting ‘hackability’ and ‘remixability’

- **meta-design examples**: Web 2.0 Technologies supporting user-generated content
  - Wikis (Wikipedia)
  - [Google-SketchUp + 3D Warehouse + Google Earth](https://sketchup.google.com)
  - Second Life
  - Open Source
SketchUp — a high-functionality 3D Modeling Environment
3D Warehouse: a Web 2.0 Environment

http://sketchup.google.com/3dwarehouse/

- **features:**
  - search, share, and store 3D models created in SketchUp
  - models include: buildings, houses, bridges, sculptures, cars, people, pets, …
  - download the 3D models to be modified in SketchUp
  - if the model has a location on earth → download it and view it in Google Earth
  - share 3D models by uploading them from SketchUp

- **challenges:**
  - what will *motivate* people to participate?
  - participation requires acquiring skills in using SketchUp → create *learning environments* for SketchUp
3D Warehouse

Tsim Sha Tsui Clock Tower
by Google
** (1 rating)
Tsim Sha Tsui Clock Tower,...
View in Google Earth

Figueroa at Wilshire
by Google
Albert C. Martin and...
View in Google Earth

1500 Walnut Street
by Google
This building located at 1500...
View in Google Earth

CPL Harold Washington Library Center
by Google
** (6 ratings)
This monumental building,...
View in Google Earth

Marriott Marquis
by Google
This Hotel in Atlanta rises...
View in Google Earth

Hearst Residence (Hearst Castle)
by Google
** (2 ratings)
San Francisco architect Julia...
View in Google Earth

Milwaukee Art Museum
by Google
**** (6 ratings)
The history of the Milwaukee...
View in Google Earth

CitySpire Center
by Google
**** (2 ratings)
Designed by Murphy/Jahn, Inc....
View in Google Earth
CU Boulder in 3D
Motivational Aspects and Meta-Design

- what will make humans want to become designers/active contributors over time?
  - serious working and learning does not have to be unpleasant but can be personally meaningful, empowering, engaging, and fun

- what will make humans want to share?
  - cultural change
  - gift cultures
  - social capital
  - reputation economy
Utility = \textbf{Value} / \textbf{Effort}

- **increase in value**: motivation and rewards for being a designer
  - feeling in control
  - being able to solve or contribute to the solution of a problem
  - mastering a tool in greater depth
  - making an ego-satisfying contribution to a group
  - enjoying the feeling of good citizenship to a community (“social capital”)

- **decrease in effort**:
  - creating support for learning to become an active contributor (= learning SketchUp)
  - extending meta-design to design for design communities
  - exploit automatically collected information sources (e.g.: collaborative filtering = “customers who bought this book also bought ….”)
“Tip of the Day” in Google Earth
# Existing Environments for Learning and Using SketchUp

<table>
<thead>
<tr>
<th>Resource</th>
<th>Concept</th>
<th>Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tip of the Day</td>
<td>informal instruction</td>
<td>easily dismissed, irrelevant, not context aware</td>
</tr>
<tr>
<td>Help Center</td>
<td>self-directed, inquiry-based</td>
<td>not context aware</td>
</tr>
<tr>
<td>SketchUp Help</td>
<td>self-directed</td>
<td>not context aware</td>
</tr>
<tr>
<td>Tooltip</td>
<td>just-in-time, on demand</td>
<td>terse, too tightly focused</td>
</tr>
<tr>
<td>Instructor</td>
<td>just-in-time, on demand</td>
<td>tool context only</td>
</tr>
<tr>
<td>User Forums</td>
<td>community, apprenticeship</td>
<td>no immediate response</td>
</tr>
<tr>
<td>Video Tutorials</td>
<td>programmed</td>
<td>passive</td>
</tr>
<tr>
<td>Self-Paced Tutorials</td>
<td>self-directed, learning by doing</td>
<td>mistakes can derail learning</td>
</tr>
<tr>
<td>Live Training</td>
<td>formal instruction</td>
<td>expensive, strict schedule</td>
</tr>
<tr>
<td>Tech Support</td>
<td>inquiry-based, constructionist</td>
<td>have to ask the right question</td>
</tr>
<tr>
<td>Error Messages</td>
<td>learning by being told</td>
<td>often too cryptic</td>
</tr>
<tr>
<td>Toolbars</td>
<td>discovery</td>
<td>terse</td>
</tr>
</tbody>
</table>
Research Challenge

Avoid Information Overload with Context Awareness

From “Anywhere, Anytime, Anyone”

“The ‘Right’ Information at the ‘Right’ Time, in the ‘Right’ Place, in the ‘Right’ Way to the ‘Right’ Person”

Human attention — not information — is the scarce resource
Information Delivery, Contextualization, and Intrusiveness
Identification of User Background Knowledge and of the Task at Hand in High-Functionality Environments
Creativity – For All of us?

- a **great interest** in recent years

- creativity: **beyond productivity**

- new National Science program: “Creativity and Information Technology (IT)”

- L3D’s research projects in this area:
  - A Next Generation Wiki for Creativity and IT (funded)
  - Democratizing Design to Unleash Social Creativity (pending)
Creativity — The “Wrong” Image?

“The Thinker” by Auguste Rodin
Social Creativity

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

- the Renaissance scholar (who knows “everything”) does not exist anymore in the 21st century

- distinct domain of human knowledge exist → of critical importance: mutual appreciation, efforts to understand each other

- complex design problems are systemic problems; they seldom fall within the boundaries of one specific domain → they require the participation and contributions of several stakeholders with various backgrounds
The Envisionment and Discovery Collaboratory
Boulder City Council and University of Colorado Regents
Sketching Support in the EDC
Buildings Sketched into a Google-Earth Client
Research Challenge

Understanding New Relations between Consumers and Producers

- Consumer Culture ("Access") and Design Culture ("Participation")

- Exploiting “Long Tail” Opportunities
Producer/Consumer Models in a Consumer Culture

- Strong Input Filters, Small Information Repositories, Weak Output Filters
- Limitation: Making All Voices Heard
Producer/Consumer Models in a Design Culture

- Weak Input Filters, Large Information Repositories, Strong Output Filters
- Limitation: Trust and Reliability of Information
Exploiting “Long Tail” Opportunities
## The Long Tail

<table>
<thead>
<tr>
<th>Company</th>
<th>Inventory Type</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rhapsody</td>
<td>Songs</td>
<td>735,000</td>
</tr>
<tr>
<td>Wal-Mart</td>
<td>Songs*</td>
<td>39,000</td>
</tr>
<tr>
<td>Amazon</td>
<td>Books</td>
<td>2.3 mil</td>
</tr>
<tr>
<td>Barnes &amp; Noble</td>
<td>Books*</td>
<td>130,000</td>
</tr>
<tr>
<td>Netflix</td>
<td>DVDs</td>
<td>25,000</td>
</tr>
<tr>
<td>Blockbuster</td>
<td>DVDs*</td>
<td>3,000</td>
</tr>
</tbody>
</table>

* inventory in a typical store
Exploiting the “Long-Tail” in Education

- **a new synergy and hybrid model**: integrate basic knowledge and skills (head of the long-tail) and idiosyncratic interests and passion (tail of the long-tail) → create richer learningscapes

- **basic knowledge and skills**: learning to learn, learning on demand, preparation for future learning, soft skills, ........

- **long-tail**:
  - interest and passion
  - self-directed learning and intrinsic motivation
  - personally meaningful problems
  - interesting example → movie: “October Sky”

- **extensive coverage** needed for supporting the infinite numbers of interesting topics — will be facilitated by a “meta-design” culture (Wikipedia)
The Other End: Cultural Literacy
Conclusion: “Building New Worlds Together”

- the future is not out there to be discovered — it has to be invented and designed

- Winston Churchill: “This is not the end. It is not even the beginning of the end. But it is, perhaps, the end of the beginning.”