Lecture 2:
Visual representation
Overview of the course

• Theory driven approaches to HCI
• **Design of visual displays**
• Goal-oriented interaction
• Designing smart systems (guest lecturer)
• Designing efficient systems
• Designing meaningful systems (guest lecturer)
• Evaluating interactive system designs
• Designing complex systems
Why talk about visual design?

Visual design questions are often where discussions about HCI start

“What colour should this be?”
“Should it be 5 pixels or 7?”
“Will this work for colour blind people?”

These conversations are a lot more complicated than they seem...
The range of visual representations

TYPOGRAPHY AND TEXT
**The Grid System**

The ultimate resource in grid systems.

"The grid system is an aid, not a guarantee. It permits a number of possible uses and each designer can look for a solution appropriate to his personal style. But one must learn how to use the grid, it is an art that requires practice."  
— Josef Müller-Brockmann

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**Articles**

- **30 Grid-Based WordPress Themes**
  In this article we have 30 WordPress themes that have been developed using a popular CSS Grid Framework, such as the 960.gs Blueprint, YUI2 and The Golden Grid.
  23 Aug 2010

- **Design & Build a Grid Based Web Design with CSS**
  Step by step walkthrough of the design and build process of a grid based WordPress theme. From the initial Photoshop concept through development.
  23 Aug 2010

- **Long Live the 12 Column Grid**
  When I first crossed the great divide from print to web, one of the earliest things I had to do was introduce a flexible multi-column grid. You know, like a magazine.
  07 May 2010

- **Fluid Grid**
  A web grid system that allows designers to save the screen real estate on large monitors and retain great design on smaller ones.
  07 May 2010

- **The Way of Typography**
  What is typography? Why do we need it? How are we going to do it? 18 Sep 2009

- **InDesign 568x762 Grid System (12)**
  InDesign file with a grid system in a 568x762 page size that is divided into 12 columns and rows using the Golden Ratio. Includes a 120p baseline grid.
  16 Apr 2009

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**Tools**

- **960 Grid System Photoshop Action**
  These actions will create a Photoshop document, ideal for laying websites out in 12, 10, 8, 6, and 4 columns.
  23 Aug 2010

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**Books**

- **Universal Principles of Design**
  Universal Principles of Design is the first comprehensive, cross-disciplinary encyclopedia of design.
  04 Nov 2009

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**Templates**

- **The Golden Grid Template**
  A PSD template based on the CSS Framework The Golden Grid by Vladimir Cameron.
  02 Mar 2010

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**Blog**

- **Forum is back up!**
  Sorry for the downtime on the forum. They're back up now.
  17 May 2010

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**Inspiration**

- **Aca Jet 170**
- **ArteOne**
- **Adidas**
- **Bekke**
- **Blank**
- **Build**
- **Corporate Risk Watch**
- **Counter-Print**
- **David Arney**
- **Design Assembly**
- **Dirty Mose**
- **Experimental Jewels**
- **Form Fifty Five**
- **Grafted Magazine**
- **Graphic Hue**
- **I Love Typography**
- **La Monaca**
- **Mark Denton**
- **Minimal Sites**
- **Moonrise**
- **Nashau**
- **NewWork**
- **OK AM**
- **Original Linkage**
- **Robin Elemen**
- **SampsonRay**
- **Scdinova**
- **September Industry**
- **Sopellos**
- **Subtractor**
- **Sveti Legacy**
- **The International Office**
- **Thinking for a Living**
- **This Studio**
- **Tokyo**
- **Typographic Posters**
- **Vannas**
- **Xavier Encinas**
- **Year of the Sheep**
The default interactive shell is now zsh. To update your account to use zsh, please run `chsh -s /bin/zsh`. For more details, please visit https://support.apple.com/kb/HT208050.

```
[lukes-mbp:~ lukechurch$ cd ~/GitRepos/Lark/KK-Project-2020-IOM/nook_sms_channel/
[lukes-mbp:nook_sms_channel lukechurch$ ls
Pipfile
Pipfile.lock
firebase_sync_cli.py
firestore_uuid_table.py
pagerduty_trigger.py
pubsub_cli.py
pubsub_cli_mock.py
rapidpro_sms.py
rapidpro_to_firestore_msg_map.py
rapidpro_to_firestore_msg_subcol1.py
[lukes-mbp:nook_sms_channel lukechurch$ pipenv sync
Installing dependencies from Pipfile.lock (b5d415)...
An error occurred while installing -e git+https://www.github.com/AfricasVoices/RapidProTools@9a656080c4e08df532cc6a2e8f1b39a8104aa0#egg=rapidprotools! Will try again.
```

```
Installing initially failed dependencies...
```

```
To activate this project's virtualenv, run pipenv shell. Alternatively, run a command inside the virtualenv with pipenv run.
All dependencies are now up-to-date!
```

[lukes-mbp:nook_sms_channel lukechurch$]
MAPS AND GRAPHS
Exports and Imports to and from DENMARK & NORWAY from 1700 to 1780

The Bottom line is divided into Years, the Right hand line into £10,000 each.

Published in the Act of Aug. 1783, 4th No. 2. by W. Mouf. London.
SCHEMATIC DRAWINGS
NODE-AND-LINK DIAGRAMS
ICONS AND SYMBOLS
VISUAL METAPHOR
XEROX 8010 Star Information System

Star provides integrated text and graphics. A variety of type sizes and styles may be used.

<table>
<thead>
<tr>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pen</td>
<td>$0.30</td>
</tr>
<tr>
<td>Brush</td>
<td>$0.50</td>
</tr>
</tbody>
</table>
PICTURES
WAYS OF SEEING
JOHN BERGER

Seeing comes before words. The child looks and recognises before it can speak.

But there is also another sense in which seeing comes before words. It is seeing which establishes our place in the surrounding world; we explain that world with words, but words can never undo the fact that we are surrounded by it. The relation between what we see and what we know is never settled.

The Surrealist painter Magritte commented on this always-present gap between words and seeing in a painting called The Key of Dreams. The way we see things is affected by what we
Theories of visual design
Theories of visual design

Whilst useful this is clearly insufficient given the range and complexity of visual interaction
<table>
<thead>
<tr>
<th>Graphic Resources</th>
<th>Correspondence</th>
<th>Design Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marks</td>
<td>Literal (visual imitation of physical features)</td>
<td>Mark position, identify category (shape, texture colour)</td>
</tr>
<tr>
<td></td>
<td>Mapping (quantity, relative scale)</td>
<td>Indicate direction (orientation, line)</td>
</tr>
<tr>
<td></td>
<td>Conventional (arbitrary)</td>
<td>Express magnitude (saturation, size, length)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Simple symbols and colour codes</td>
</tr>
<tr>
<td>Shape</td>
<td>Topological (linking)</td>
<td>Texts and symbolic calculi</td>
</tr>
<tr>
<td>Orientation</td>
<td>Depictive (pictorial conventions)</td>
<td>Diagram elements</td>
</tr>
<tr>
<td>Size</td>
<td>Figurative (metonym, visual puns)</td>
<td>Branding</td>
</tr>
<tr>
<td>Texture</td>
<td>Connotative (professional and cultural association)</td>
<td>Visual rhetoric</td>
</tr>
<tr>
<td>Saturation</td>
<td>Acquired (specialist literacies)</td>
<td>Definition of regions</td>
</tr>
<tr>
<td>Colour</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Line</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Geometric elements</td>
<td>Topological (linking)</td>
<td>Texts and symbolic calculi</td>
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<tr>
<td>Letter forms</td>
<td>Depictive (pictorial conventions)</td>
<td>Diagram elements</td>
</tr>
<tr>
<td>Logos and icons</td>
<td>Figurative (metonym, visual puns)</td>
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<tr>
<td>Alignment grids</td>
<td>Containment</td>
<td>Identifying shared membership</td>
</tr>
<tr>
<td>Borders and frames</td>
<td>Separation</td>
<td>Segregating or nesting multiple surface conventions in panels</td>
</tr>
<tr>
<td>Area fills</td>
<td>Framing (composition, photography)</td>
<td>Accommodating labels, captions or legends</td>
</tr>
<tr>
<td>White space</td>
<td>Layering</td>
<td></td>
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<tr>
<td>Gestalt integration</td>
<td></td>
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</tr>
<tr>
<td>The plane</td>
<td>Literal (map)</td>
<td>Typographic layouts</td>
</tr>
<tr>
<td>Material object on which the marks are imposed (paper, stone)</td>
<td>Euclidean (scale and angle)</td>
<td>Graphs and charts</td>
</tr>
<tr>
<td>Mounting, orientation and display context</td>
<td>Metrical (quantitative axes)</td>
<td>Relational diagrams</td>
</tr>
<tr>
<td>Display medium</td>
<td>Juxtaposed or ordered (regions, catalogues)</td>
<td>Visual interfaces</td>
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<td></td>
<td>Image-schematic</td>
<td>Secondary notations</td>
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<td>Embodied/situated</td>
<td>Signs and displays</td>
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Use 1: Usability analysis

- Analyse a design using this taxonomy
  (e.g. Uses connotative correspondence)

- Determine if the uses are appropriate
  (e.g. do people think that blue is ‘off’ or ‘cold’?)

Cases where the visual analysis implies one connection but the operation implies another will create substantial usability problems
Use 1: Usability analysis
Use 1: Usability analysis

Mapping, Categorical: Off, cold, warm, hot

Mapping, Magnitude, Colder -> Warmer
Use 1: Usability analysis

Mapping, Categorical: Off, cold, warm, hot

Mapping, Magnitude, Colder → Warmer
Mapping, Direction(!!!), Colder -> Warmer
The programming analogy challenge 2022: Luke on Fusion 360

Action at a distance
(see Attention Investment later in the course)
Colour, Conventional, Category
The programming analogy challenge 2022: Alan on musical scores

This was an easy one (Sonic Pi was developed here) but …

What PL features are \textit{not} relevant to music?
What musical features suggest \textit{alternative} PL approaches?

And how is music notation better/worse than PL notations?
Thread synchronisation

Separation of concerns
Recent research: Designing syntax to support the musical phrase as a semantic unit


Original typesetting by Arild Stenberg

From Sternberg (2018) *Legibility of Musical Scores and Parallels with Language Reading*
J. S. Bach Chorale number 285
Redesigned for performance by Arild Stenberg
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