Creating Digital Illustrations for Your Research

Workshop II
February 10, 2016

Presented by Anneli Hoggard for the Rice University CWOVC and DMC
Workshop sections

Graphic
  .. Function
  .. Design
  .. Execution
  .. Style
Trust your instincts

Don’t make it too complicated …

<table>
<thead>
<tr>
<th>AuNP aggregation increases with [NaCl]</th>
<th>AuNP aggregation increases with [NaCl]</th>
<th>AuNP aggregation increases with [NaCl]</th>
</tr>
</thead>
</table>

Prioritize **simplicity** + **message**

Hm. It’s hard to say, Charlie. Have you tried calculating the contrast coefficient for each combination?
Types of Research Illustrations

- Power Point Figures
- TOC / Graphical Abstract
- Poster Cartoons
- Proposal Overview
- Article Schematics
- Research Graphics
Goal – Introducing proposed research that involves the use of fluorescence microscopy to learn about chemical reactions on the surface of nanoparticles in real time
A note about sketching

People who doodle remember 29% more than those who do not.

“Doodling and dramatically enhances the experience of learning.” – Sunni Brown, author of The Doodle Revolution
1. Define your message

**Goal** – envision the end result

What are you trying to communicate?

**Ask:**

- What is most important?
- How would you explain the idea to a friend?
- How to draw it on a napkin?
- I would hire this graphic to _____________
- Which aspects are easier to show than tell?
- What does your audience know already?
# 2. Brainstorm components

<table>
<thead>
<tr>
<th>Noun checklist</th>
<th>Method checklist</th>
</tr>
</thead>
<tbody>
<tr>
<td>subject</td>
<td>□ Wikihop</td>
</tr>
<tr>
<td>technique</td>
<td>□ Search for similar</td>
</tr>
<tr>
<td>instrument</td>
<td>□ Google images</td>
</tr>
<tr>
<td>type of data</td>
<td>□ Google image + “cartoon”</td>
</tr>
<tr>
<td>findings</td>
<td>□ paper figures</td>
</tr>
<tr>
<td>sample</td>
<td></td>
</tr>
<tr>
<td>abstract concepts</td>
<td></td>
</tr>
<tr>
<td>equations</td>
<td></td>
</tr>
<tr>
<td>symbols</td>
<td></td>
</tr>
</tbody>
</table>
Component sketches

Temporal resolution

milliseconds

I

t
3. Revise vision

**Goal** – Decide which parts you need and don’t
Ask these questions –

1. Is it necessary?
   - no
   - yes

2. Can you imagine it?
   - yes
   - yes

3. In an way that’s possible?
   - yes

Include it!
4. Rough sketch

**Goal** – Guide for figure composition

**Consider:**
- Scale
- Flow
- Organization
- Emphasis
- Simplicity
Thoughts on flow

- The viewer’s focus should move easily through the graphic entry point in top left

Logical arrangements

Thoughts on organization

- Hidden grids can visually organize spaces and elements
Thoughts on emphasis

Varying elements →
Make the key part of the figure stand out

4. Rough sketch

OUTLINE

- Spatial
- Temporal

Catalytic events
5. Create components

- nanorod
- product
- location
- intensity vs. time trace

covered in workshop III
6. Combine and arrange

**Goal** – create a digital 1\(^{st}\) draft

**Consider:**

- Color scheme
- Visual contrast
- Simplicity
7. Revise

**Goal** – polish the final graphic

**Strategies:**
- Remove something, see if you like it
- Print it at final size
- Survey peers
- CWOVC
Technique

Fluorescence microscopy yields information about kinetics and location
Technique

Fluorescence microscopy yields information about kinetics and location
Revision example

Initial

Revised

Revision example

Initial

Revised

Under the table...

Design practice

- Read your Science news article snippet
- Design a graphic that enhances understanding
- Rough sketch (10 min)
Specific Aim III – B: Charge transfer rate constants.

We will determine the charge transfer rate constant using the rate of single molecule fluorescence events obtained through super-resolution imaging. The rate of hot electron transfer from the semiconductor-coated nanorod to a molecular acceptor is a convolution of the rate of adsorption onto the semiconductor surface, and the rate of charge transfer (Figure 12 E). The uncorrected charge transfer rate will be measured through the on-off intervals associated with HN-BODIPY or resorufin production. The dye molecule adsorption rate will be elucidated for the same particles through control experiments with the fluorescent product molecule. The charge transfer efficiency between the molecular acceptor (m) and semiconductor shell (SC), $\eta_{SC-m}$, will be calculated from the adsorption and hot electron transfer rate constants determined for individual coated nanorods. We will also analyze the electron transfer efficiency from the metal nanoparticle to the molecule, $\eta_{M-m}$, which accounts for hot electron losses in the semiconductor shell, through a combination of $\eta_{M-SC}$ from Specific Aim II and $\eta_{SC-m}$. 
Step summary

1. Define message
2. Brainstorm components
3. Revise vision
4. Rough sketch
5. Imagine components
6. Combine and arrange
7. Revise
Now find your group

Revise together

- Share and compare your sketches
- Combine ideas
- Group sketch (10 min)
Software poll

Adobe Illustrator or Inkscape?

- free at DMC
- professional standard

- open source (free to use)
- less “fancy”
Over the next two weeks...

Brainstorm concepts and rough sketch ideas for a graphic to work on.