A Framework for Creative Visualization-Opportunities (CVO) Workshops

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Presented by Alexander Lex

Goal

- Effectively understand requirements and opportunities for a data (visualization) software development / research project

- Build rapport with stakeholders

Interviews and observations

require tremendous time and energy from all stakeholders.

Creative visualization-opportunities (CVO) workshops:

structured workshops in which domain collaborators and researchers explore opportunities for a collaboration.

When to run a workshop?

- You want to develop a novel visualization / data analysis tool

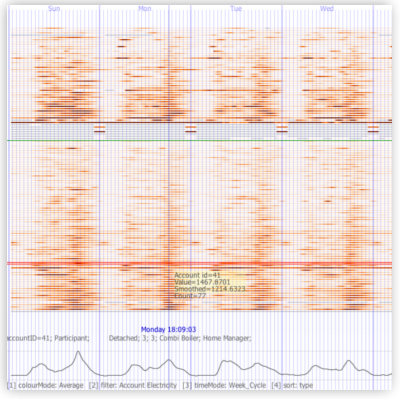
- Initial couple of meetings are promising
  - Collaborators **have** interesting data
  - Collaborators **have time** to work on a project
  - Off-the-shelf tools won’t suffice

- Don’t use CVOs for very initial getting-to-know each other

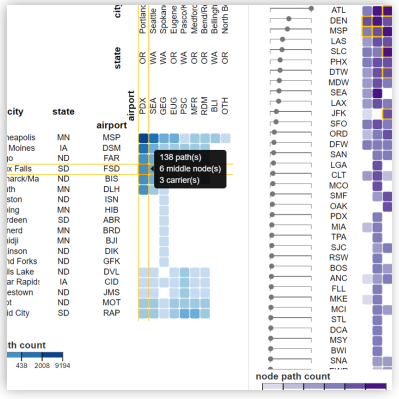
CVO workshops are flexible:

they can accelerate early stages of practically any collaboration.

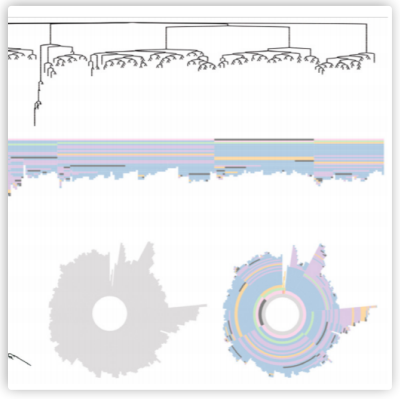
Cartography



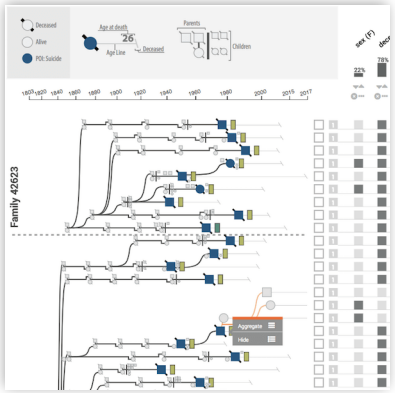
Energy analysis



Neuroscience

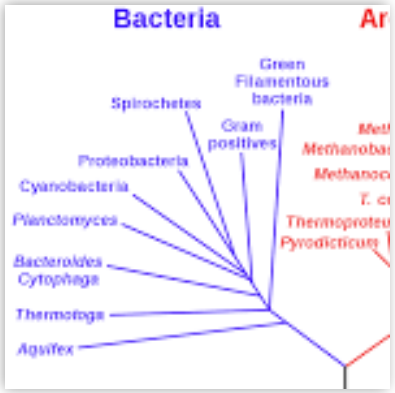


Optimization

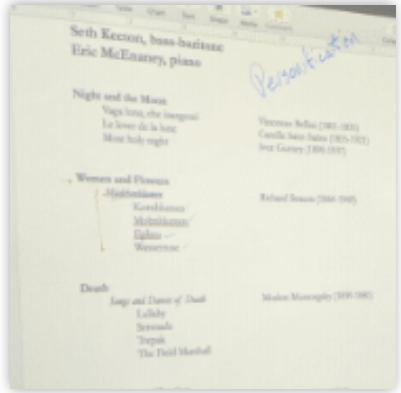


Genealogy

Human terrain



Phylogenetics



Recital composition

National Science Foundation
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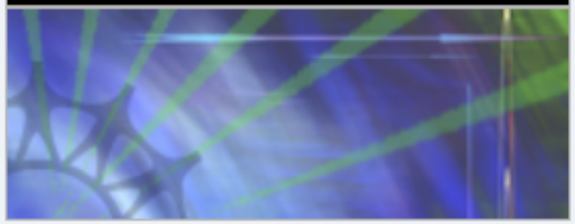

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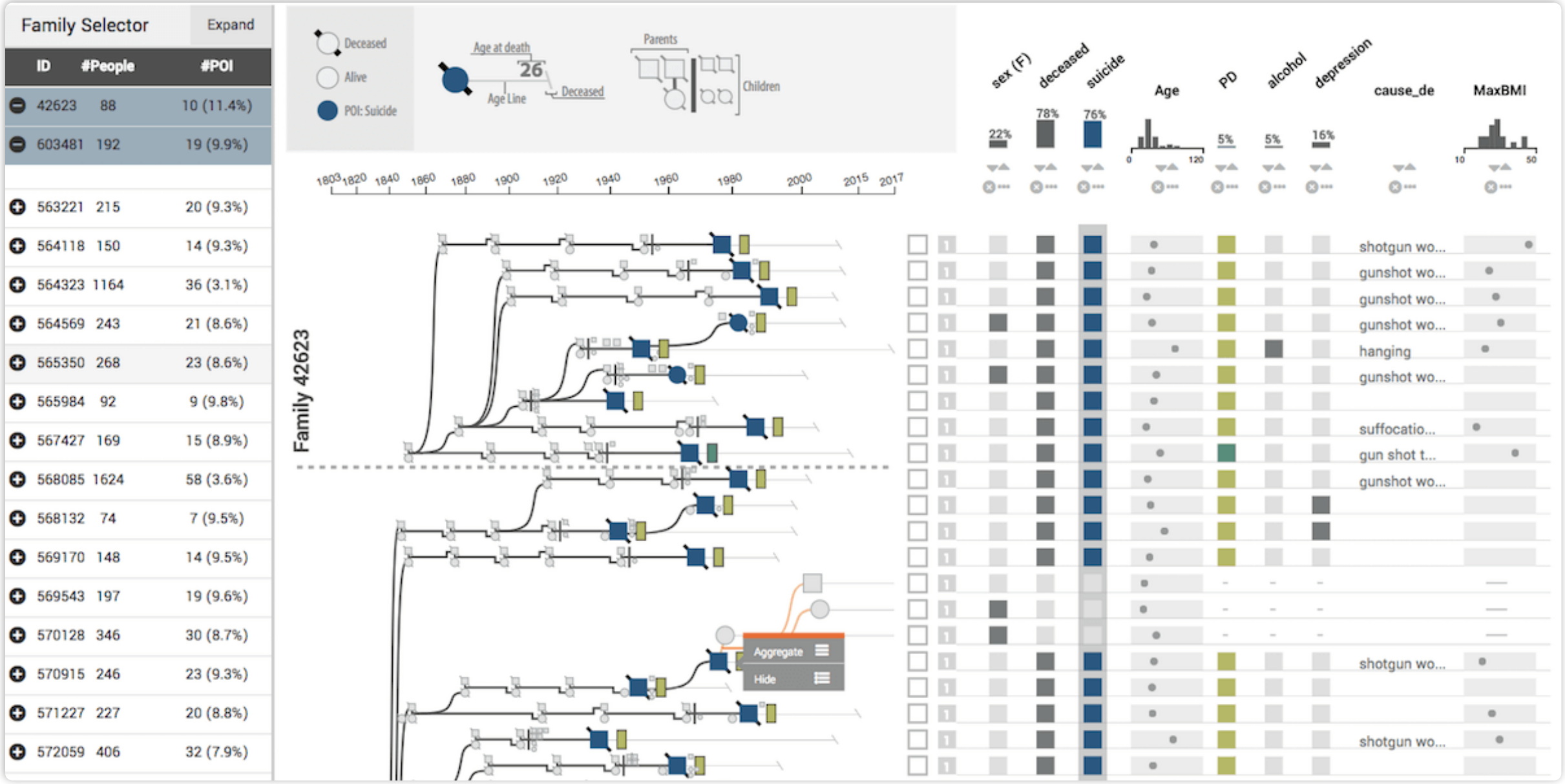
Award Abstract #1835893

Collaborative Research: Framework: Software: HDR: Reproducible Visual Analysis of Multivariate Networks with MultiNet

NSF Org:	OAC Office of Advanced Cyberinfrastructure (OAC)
Initial Amendment Date:	September 6, 2018
Latest Amendment Date:	September 6, 2018
Award Number:	1835893
Award Instrument:	Standard Grant



[Nobre et al. 2017]

CVO workshops are effective:

they provide tremendous value, both intellectually and interpersonally.

CVO workshops explore a wide range of possible directions for collaborations.

“The interpersonal leveling and intense revisiting of concepts made more progress in a day than we make in a year of lab meetings ... [the workshop] created consensus by exposing shared user needs.”

- Workshop participant [Kerzner et al. 2017]

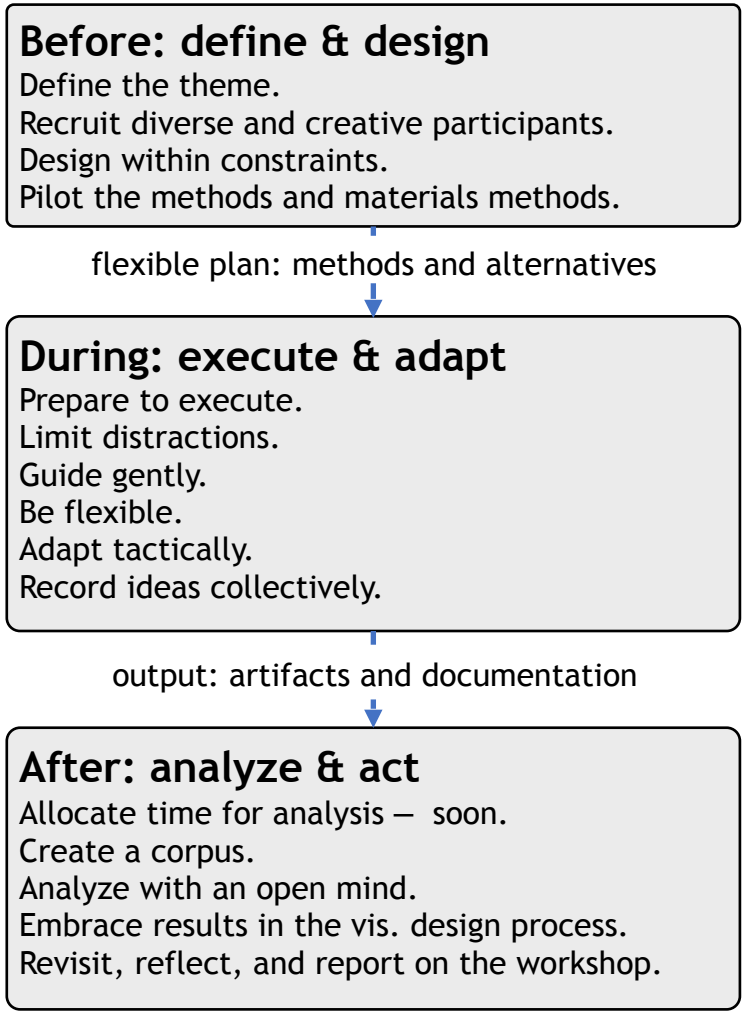
A framework provides understanding,

instead of causal or predictive knowledge.

How to Run A Workshop

Six TACTICs for effective CVO workshops:

- (T)opic
- (A)gency
- (C)ollegiality
- (T)rust
- (I)nterest
- (C)hallenge



Planning a workshop is a design problem.

A workshop theme, its central topic or purpose, must be defined and iteratively refined.

Workshop Format

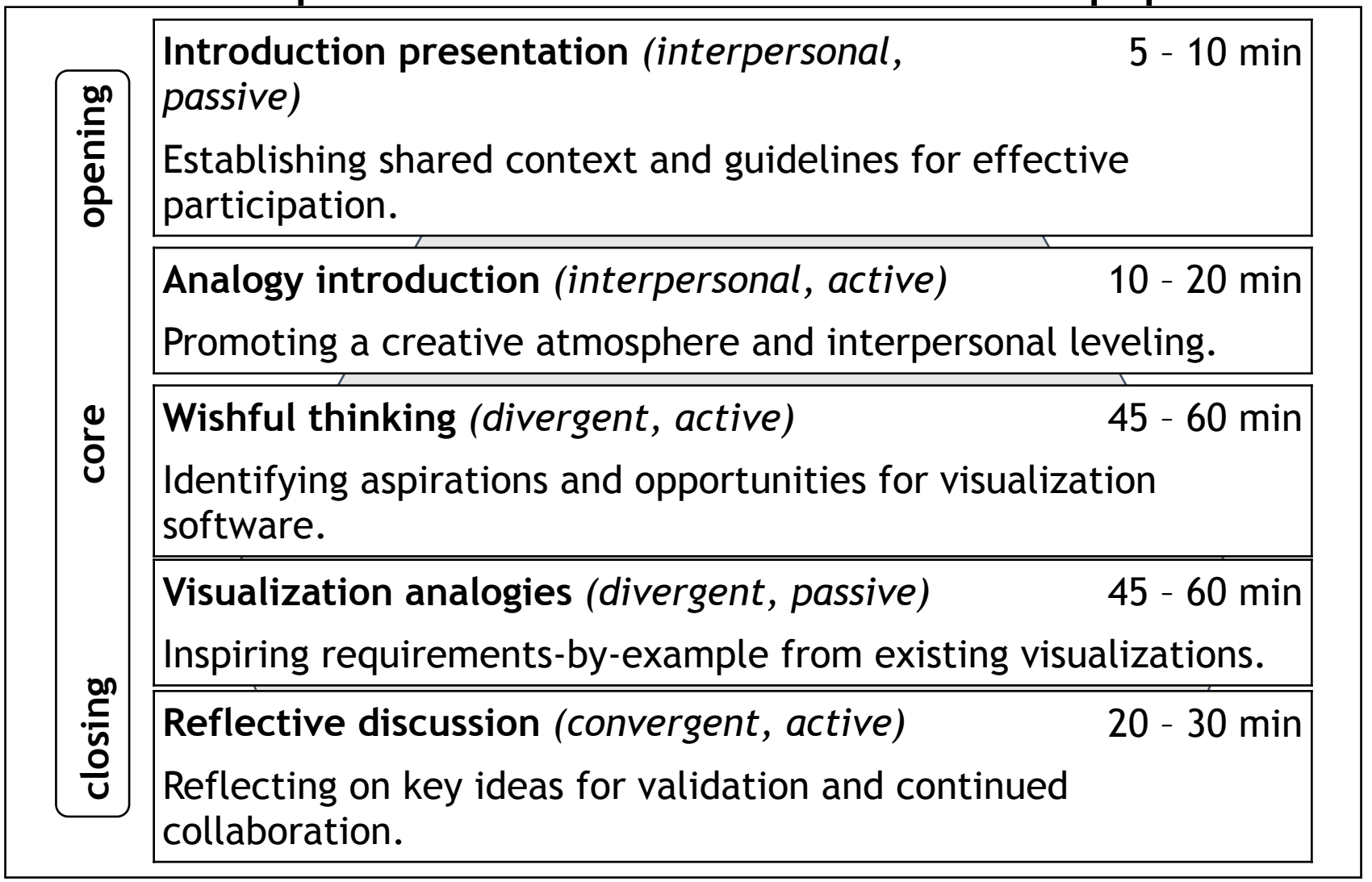
- **Opening**: pulling people in, making them comfortable, setting up a creative mindset
- **Core**: generating and evaluating ideas
- **Closing**: prioritizing, reflecting

https://bit.ly/CVOworkshops

Best practices depend on local context, preference, and experience.

Example Workshop

In effective CVO workshops, methods work in concert to explore visualization opportunities.



Analogy Introduction

- Playful introductions-by-analogy to prime for creative thinking and to support interpersonal leveling.
- For example:
  - “If you had a superpower, what would it be?”
  - “If you were an animal, what would it be?”

Wishful thinking: elicit shared domain challenges.

Think about aspirations for your data...

*What would you like to **KNOW**?*

*What would you like to **DO**?*

*What would you like to **SEE**?*

Individually...

Visualization Analogies

- A curated presentation of visualizations inspires requirements-by-example.

- Ask participants to individually record analogies to their domain and to specify aspects of the visualizations that they like or dislike.

Reflective Discussion

- “What has surprised you most today?”
- “What do you know now that you did not know this morning?”
- “What will you do differently tomorrow?”

Other Methods

Storyboarding

core, convergent, active
1 hour

Creating a graphical story can synthesize and summarize ideas from the workshop.

Visual Improv

opening, interpersonal, active
5 - 15 min

Rapidly drawing ideas of increasing complexity helps to prime for sketching and to suspend judgement.

Description

A facilitator reads a list of prompts, allowing participants 5 - 10 seconds to draw each idea. The prompts gradually increase in challenge, and include both concrete and abstract ideas. For example, we may ask participants to draw a line, a squiggle, a shape ... then turn one of those drawings into a mountain, mode of transportation, a pet, a meal ... Then, turn one of those drawings into a friendly mode of transportation, a helpful pet, a friendly meal...

After a few minutes of drawing, participants can be asked to find three pictures from around the room and create a story to introduce themselves or tell a story.

When facilitated effectively, this is a high-energy method that can engage participants — garnering *interest* in the workshop. It encourages *agency* as participants express themselves through sketching. Importantly, it also prepares participants to think visually, a key part of the *topic*.

Materials

- markers for drawing
- butcher paper or poster board

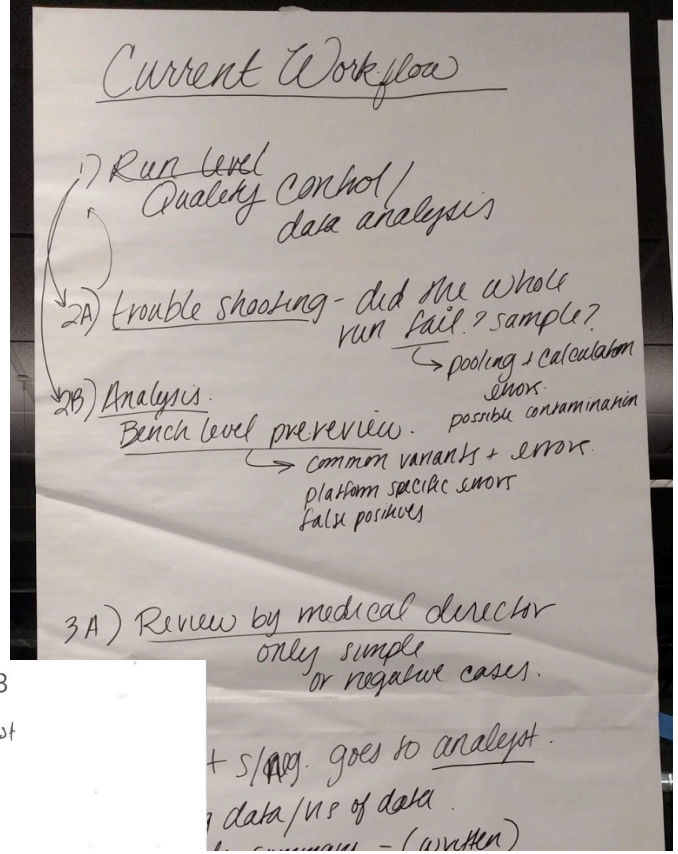
Visual Ranking

core, convergent, active
45 - 60 min

https://bit.ly/CVOworkshops

Post-Workshop Data Analysis

- Transcribe and Code artifacts
- Tangible Outcome: Prioritized Lists of Requirements, Problems, Ideas…
- Check back with participants



ARUP CVO Workshop, October 9, 2018

Adam Clayton Clinical variant Scientist
Genomics and cytogenetics

Workflow Walkthrough

Prompt: So we can get a better understanding of your workflow a
the process of generating tasks, we want you to walk through the
of a typical analysis. **Please answer the below questions as you w
through.**

- **What are the most important tasks?** Presenting complex resu Getting accurate results Meeting TAT's of C
- **What are you looking for?** Most clinically relevant findings
- **What are the good/bad aspects of your current workfl**
- **What are some constraints you have with your current workflow?** Convincing people that another way might be better. tools.
- **How do you expect this to change in the future?** common platform /sample specific errors are masked. Provide a variants that need investigating - facilitate /automate the investigation Be able to quickly find similar variants that were seen pr

Post-it Notes

What would like to know from this data
What would you like to be able to do
What would you like to see

Group 2

Algorithm:

1.
Exon /gene level CNV's (without false positives or negatives)
Quality of the call
View of raw data
View of supporting reads of CNV, translocation, etc
Algorithm for detecting deletions/duplicates with confidence score

Pitfalls

- Recruit diverse and creative participants.
- Know the Domain
- Create physical and visual artifacts.
- Promote continued collaboration.
- …