

# Study Protocol Guide

## Understanding How In-Visualization Provenance Can Support Trade-off Analysis

This document describes the steps we took during **Session II** of the observational study. Note that Session I was run with VisProm/EvoGraphDice without the provenance views, thus participants already knew how the basic tool works, and we only had to introduce the provenance views.

Each study session was run in five parts. Below are the general guidelines we tried to adhere to in each session, but the exact questions can vary depending on the case study.

- **PART 1- Introduction : Welcome and tool setup [≈10 mins]:**
  - Welcome, aim of the study, ask permission to record.
  - General chat about the dataset provided by domain experts, and the research questions/trade-offs they would like to explore.
  - Ask if participants remember the insight/s they reached in Session I. If they don't then give them hints on how to proceed.
- **PART 2- Reproduce Insight Without Log [≈15 mins]**
  - Show stripped down version of VisProm (without provenance views).
  - Load dataset.
  - Ask participants to reproduce an old insight from Session I. If there were multiple insights, ask them to choose the most important one. If they don't then give them hints on how to proceed. Also ask:
    - What views did you select the most ?
    - What dimensions did you view the most ?
    - What selections did you make ?
    - What favorites did you add ?
    - What insights did you reach ?
    - Without going into too much detail about the specific steps you took last time, do you remember how you got to insight X ?

- For us: ask participants to speak out loud and to articulate what they are doing and what interesting things they find as well as issues they encounter.
- **PART 3- Reproduce Insight With Log [≈15 mins]:**
  - Show full version of VisProm with provenance views.
  - Give a tour of the new VisProm features: the provenance views.
  - Now you have the tool with your interaction logs from Session I visualized: Can you understand / better remember what you did last time now?
    - What views did you select the most ?
    - What dimensions did you view the most ?
    - What selections did you make ?
    - What favorites did you add ?
    - What insights did you reach ?
    - Without going into too much detail about the specific steps you took, do you remember now how you got to insight X?
  - Does the provenance in VisProm reflect well your past exploration, e.g., views you focused on, features you explored or not explored? Does it comply with what you initially thought you did last time?
  - For us: note down how/if they use the provenance views, and any differences/similarities with regards to what they said in Parts 1&2.
- **PART 4- Open Explore [≈30 mins]:**
  - Use the full version of VisProm with provenance views.
  - Open exploration: explore trade-offs and try to find new insights.
  - For us: Observe if participants use provenance views during the exploration, observe how they explore the different trade-offs.
- **PART 5- Discussion [≈20 mins]**
  - How far do you think you explored trade-offs with the new version of VisProm, compared to what you did in session I ?
  - How useful was the provenance/logs loaded from Session I to you?
  - Were the new provenance visualizations useful ? why?
  - Can you think of situations where provenance visualization would be useful to your exploration?
  - Imagine after this session, you go back to your office and discuss with your colleague/supervisor what you did today, what would you tell them?
  - How often did you notice the provenance visualizations ?
  - How often did you consult them explicitly ?

- Currently the update of provenance happens each time a selection is created, what do you think about the frequency of provenance update? would you rather see it more frequently, less frequently, on user demand? Post-exploration?
- Were there any missing features that would have helped you better replicate the results from last time?
- Anything else is missing that you felt would have been good to bring back from last session or added information that would be useful to you?
- Anything else to add in terms of provenance, when resuming the exploration versus dynamically as you were exploring ?
- Any suggestions on how to improve the tool to support trade-off analysis?
- Any suggestions on what provenance information would be useful to show to support trade-off analysis?
- Any other comments
- **Online questionnaire:** <https://forms.gle/8s3g57XiUJwbMRmK6>