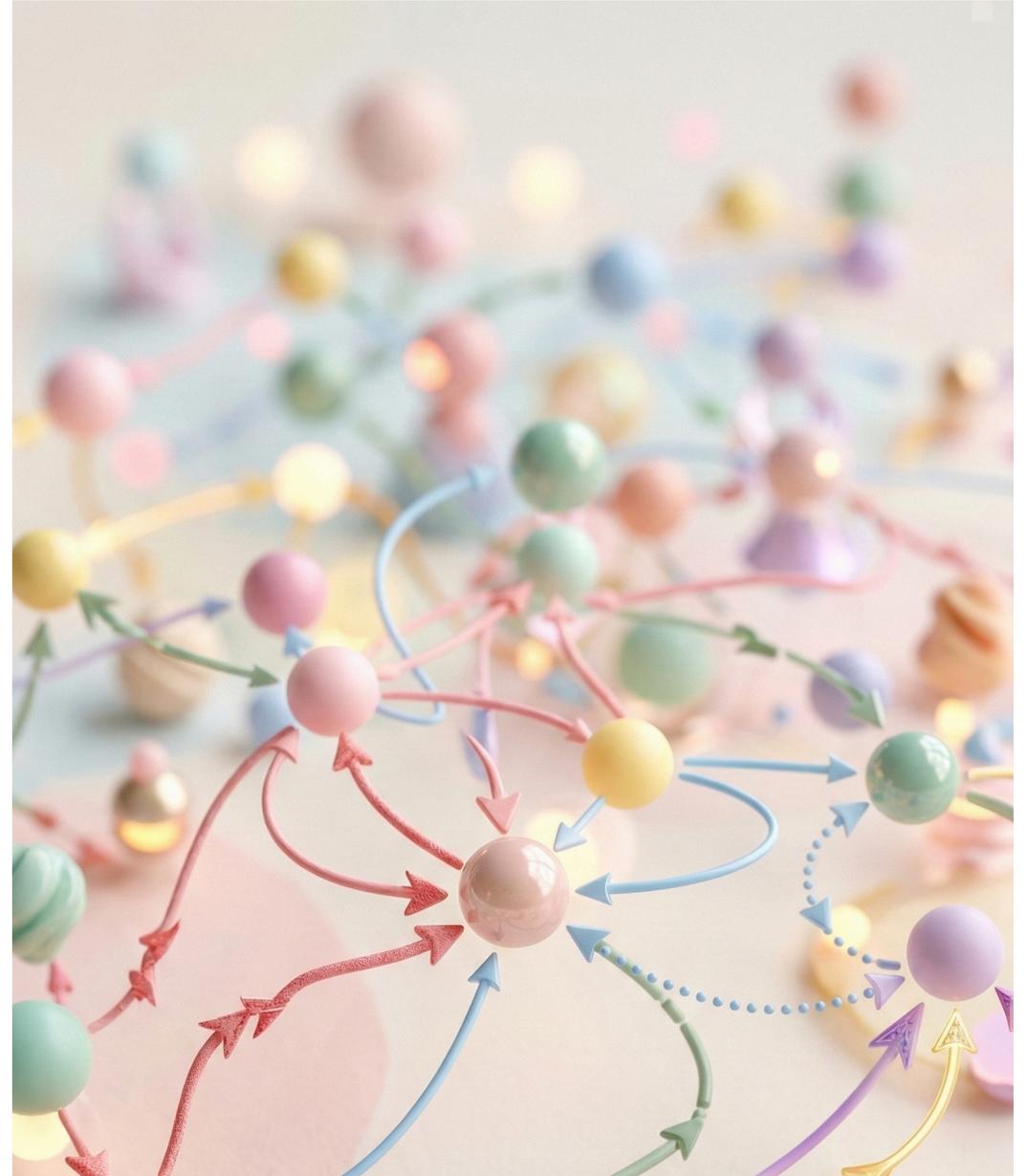


5 • PROJECT ASSIGNMENT

VAST 2025: Mini-Challenges Overview
**Oceanus Island: A Microcosm of
Music, Economy, and Intrigue**

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Mini-Challenge 1: The Rise of Oceanus Folk

Background & Context

- **The Star:** Sailor Shift, a global superstar who popularized "Oceanus Folk."
- **The History:** Started in the all-female band *Ivy Echoes*, broke out solo in 2028, and consistently champions new artists and collaborations.
- **The Analyst:** Silas Reed, a local journalist writing *Oceanus Folk: Then-and-Now*.
- **The Data:** A large knowledge graph of musical artists, producers, albums, songs, and influences.

MINI CHALLENGES OVERVIEW



MC1: Analytical Tasks (1/2)

Profiling Sailor Shift & Spreading Influence

- **Career Profile:** Visualize who influenced Sailor over time, her direct/indirect collaborations, and her impact on the Oceanus Folk community.
- **Genre Spread:** Illustrate how Oceanus Folk spread globally.
 - Was the rise gradual or intermittent?
 - Which top artists and external genres were most affected?
 - How has Oceanus Folk evolved by drawing contemporary inspiration from other genres?

MC1: Analytical Tasks (2/2)

Predicting the Next Stars

- **Profile a Rising Star:** Use the visual insights to define what makes a "rising star" in this ecosystem.
- **Compare Careers:** Visualize and contrast the career trajectories, popularity, and influence of three specific artists.
- **Predict:** Based on these characterizations, predict the next three Oceanus Folk stars over the coming five years.

Mini-Challenge 2: The COOTEFOO Scandals

Background & Context

- **The Conflict:** Oceanus's transition from a fishing-based economy to tourism.
- **The Board:** COOTEFOO (Commission on Overseeing the Economic Future of Oceanus) advises the government but is mired in scandal.
- **The Accusers:** - **FILAH:** Pro-fishing, accuses the board of pro-tourism bias.
 - **TROUT:** Pro-tourism, accuses the board of appeasing the fishing industry.
- **The Analyst:** E.D. Moray, a journalist for the *Haacklee Herald*, investigating government accountability.

MC2: Analytical Tasks (1/2)

Investigating Bias in Fragmented Data

- **Analyze Group Claims:** Use visual analytics to determine if TROUT and FILAH's accusations are supported by *their own* restricted datasets.
- **The Big Picture:** Combine both datasets with additional acquired records into a single knowledge graph.
- **Committee Assessment:** Visualize how COOTEFOO members spend their time in the complete dataset to see if the committee as a whole is biased.

MC2: Analytical Tasks (2/2)

Contextualizing Incomplete Datasets

- **Compare & Contrast:** How do conclusions drawn from the fragmented TROUT/FILAH datasets change when viewed within the complete dataset?
- **Individual Behavior:** - Highlight a specific person's behavior across different datasets.
 - Analyze a COOTEFOO member accused by TROUT—what missing evidence changes the judgment?
 - Identify whose behaviors are most impacted by sampling bias in the FILAH dataset.

Mini-Challenge 3: Nemo Reef Closure

Background & Context

- **The Shift:** Crackdowns on illegal fishing led to investments in regulated ocean tourism, causing local tensions.
- **The Incident:** Temporary, secretive closure of Nemo Reef coinciding with Sailor Shift filming a music video.
- **The Players:** High-level officials, Sailor's team, local influential families, and *The Green Guardians* (conservationists).
- **The Analyst:** Clepper Jessen, former analyst turned journalist, using intercepted radio communications mapped into a knowledge graph.

MC3: Analytical Tasks (1/2)

Temporal Patterns & Group Dynamics

- **Daily Communications:** Develop graph-based visualizations to identify daily temporal patterns in radio traffic over the two weeks.
 - How do patterns shift? Who has influence over specific entities?
- **Group Interactions:** Explore relationships between vessels and people.
 - Identify closely associated groups (e.g., Environmentalists, Sailor Shift's crew, fishing/leisure vessels).
 - Determine predominant topic areas for each group.

MC3: Analytical Tasks (2/2)

Pseudonyms & Illicit Activity

- **Entity Resolution:** Identify users of pseudonyms (e.g., "Boss", "The Lookout") and handle cases where multiple entities use the same alias.
 - *How do these pseudonyms change the understanding of recorded activities?*
- **Investigating Nadia Conti:** Suspected of continuing illicit activity post-fishing crackdown.
 - Visually summarize Nadia's actions to prove or disprove Clepper's suspicions.

DESIGN CHALLENGE



What is a Knowledge Graph?

- **Structured Representation:** Organizes information into entities (concepts) and relationships.
- **Graph Structure:**
 - **Nodes:** Represent the entities.
 - **Edges:** Represent the relationships between them.
- **Beyond Traditional Graphs:** Nodes and edges have many associated properties, which vary widely across the entire graph.

The Visualization Challenge

Traditional visual representations (like basic node-link diagrams or adjacency matrices) struggle with real-world knowledge graphs due to:

- **Massive Scale:** Often containing thousands of nodes and edges.
- **Data Imperfections:** Information is rarely a perfect model of the world; it contains conflicting, uncertain, or missing data.
- **Cognitive Overload:** Node-link diagrams of large-scale knowledge graphs quickly become "hairballs" that are incredibly difficult to interpret.

The Mission

Your Task: Design a visual analytics interface that addresses analytical tasks for non-expert users.

- **Target User:** A domain-expert analyst trying to explore a story (not necessarily a graph/network expert).
- **The Goal:** Balance ease of use with enough information density to support complex tasks.
- **Scope:** Can focus on the whole graph or a focused subset contextualized by the full graph. (*Note: Do not focus on constructing, tuning, or refining the graph.*)

Key Analytical Tasks

Your design must help the user accomplish one or more of the following:

1. **Discover:** Find new information or previously unseen relationships.
2. **Audit:** Find anomalies and inconsistencies within the data.
3. **Predict/Infer:** Infer missing data based on the surrounding context.

Challenge Guidelines

- **Format:** A visual analytics *design* is the initial goal (conceptual drawing or mockup).
- **Data:** Data analysis is not required, but you can use *any* dataset to inform your design. No specific data is being released for this challenge.
- **Focus:** The core requirement is demonstrating how your design facilitates analysis and understanding of the data.

Course Integration: This /s Your Final Project

Turning Global Competition into Classroom Collaboration

- **Collaborative Open Work:** We will use our classroom time as an open studio to brainstorm, design, review, and refine your ideas together.
- **Your Final Exam:** If you participate in this challenge, your final design submission will serve as the basis for your final exam.
- **No Extra Projects:** You do not need to create a separate, unrelated project for this course.
- **The Evaluation:** Your final grade will be based on a formal discussion and presentation of your VAST Design Challenge deliverables.

How We Will Work Together

Classroom Milestones & Expectations

- **Open Feedback:** Expect regular peer reviews and open discussions. We are not participating to a global competition, but collaborating locally.
- **Iterative Design:** We will break the challenge deliverables into manageable modules.
- **The Finish Line:** By the end of the course, we will have an integrated tool for managing and analyzing knowledge graphs, useful for the students of next year and beyond.

Toolbox & Resources

- **Graph Visualization Libraries:** D3.js, Vega-lite
- **Technical Resources:** Python libraries (NetworkX, pandas, numpy, scikit-learn)
- **Design Inspiration:** Existing knowledge graph visualizations, VAST Challenge archives, and real-world examples of complex data visualization.
- **Collaboration Tools:** GitHub for version control
 - Single repository for the classroom, separate forks for each student to work on their designs.
 - Regular pull requests for peer review and feedback.

Let's Brainstorm!

Questions & Ideation