

NETWORK GRAPHS AND THE CASE FOR VIRTUAL REALITY

Robert J. Reynolds, PhD^{1,2,3}, James R. (Jake) Mireles⁴

¹ Mortality Research & Consulting, Inc.,

² Baylor College of Medicine, Translational Research Institute for Space Health

³ Human Health and Performance Directorate, NASA Johnson Space Center

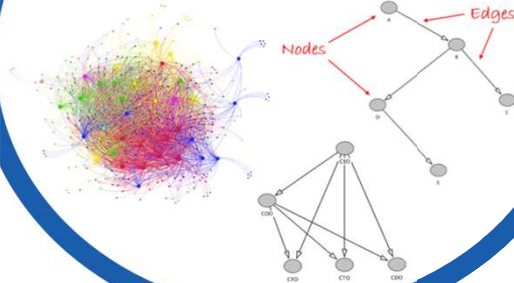
⁴ Aviar Technology, LLC, Houston, TX

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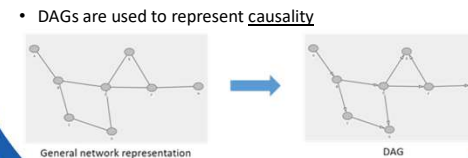
Network Maps (Graphs)

A diagram in which discrete entities are represented by “nodes” and relationships (links or connections) between those entities are represented by edges.

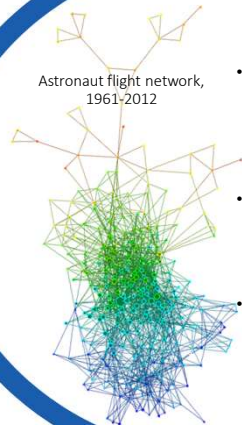


Directed Acyclic Graphs (DAGs)

- Specific type of graph
 - **Directed**: Single-headed arrows show direction of relationship
 - **Acyclic**: No loops (“cycles”); relationship goes one way and there are no directed paths back to a node once we’ve left it
 - **Graph**: Representation with nodes and edges



Why VR?



- Network maps may be thought of as two-dimensional projections of fundamentally three-dimensional
- Unlike in geographic mapping, this will not lead to distortion, but can make the map difficult to understand
- Visualizing in a 3D VR environment allows us to “get inside” the network and actually see more detail

Human Systems Risk Board

- Role is to “ensure a consistent, integrated process for managing human system risks that are critical to successful human exploration beyond low Earth orbit.”
- Traditionally, risks have been considered, researched, and managed in risk custodial teams, but with minimal view of inter-relation of risks.
- Several attempts have been made to visualize risk interrelatedness, but none have caught on.
- HSRB will be constructing a DAG to represent the NASA Human Systems Risk Network.



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*Virtual Reality / Data Science Risk Assessment & Analysis