Forest Network Visualization

Concept & Data Source

- Visualization of tree-mycorrhizal fungus interaction networks in Douglas-fir forests
- Data source: Borealis dataset (doi:10.5683/SP2/SNUIDG)
- Represents 759 data points across:
    - Two fungal species (R. vesiculosus and R. vinicolor)
    - Three network sizes based on connection count
    - Two soil conditions (xeric and mesic)
- Each falling drop maps to a fungal connection, with colors and sizes corresponding to species and network size

Physical Construction

Display Assembly:

- 24" × 6" clear glass cylinder vase
- Custom wooden housing:
    - Base unit (12" × 12" × 4") with hinged access panel
    - Top cap (8" × 8" × 2"), removable for maintenance
- Two 3/8" brass support tubes
- Integrated LED illumination in top cap
- Leveling feet
- Ventilation system with cooling fan

Fluid System

Hardware:

- Two peristaltic pumps delivering 0.1ml, 0.2ml, 0.4ml drops
- Two 500ml reservoirs with level indicators
- 1/8" ID silicone tubing
- Drop detection sensors
- Temperature monitoring system
- Emergency overflow protection

Fluid Compositions:

- Xeric Layer (Bottom 40%):
    - 70% light corn syrup, 25% glycerin, 5% water, 0.1% mica
    - Viscosity: 3500-4000 cP at 70°F
    - Density: 1.32 g/cm³

- Mesic Layer (Top 60%):
    - 50% light corn syrup, 35% glycerin, 15% water, 0.1% mica
    - Viscosity: 2000-2500 cP at 70°F
    - Density: 1.28 g/cm³
- Flow rate: ~1ml per hour per color
- Natural gradient formation between layers

Electronics & Control

Hardware:

- Arduino Nano microcontroller
- Power supply: 12V DC, 2A
- USB programming port
- Drop timing: 30-40 seconds per sequence
- Data storage: ~3KB for full dataset

Software:

- Drop size calibration system
- Error detection and handling
- Temperature compensation algorithms