

# Intelligent BOTs: Some Ideas for Data Visualization

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Visualization Panel

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# BOT Ideas for 3D Visualization

## Find new ways to visualize the data

- As a graph model
- As conditional probabilistic relationships
- As anomalies
- As trends or breaks in trends
- As distinctions not worth making

## Assist the analyst in visualizing the data

- Find pairs and triples of variables to visualize
- Find viewing angles that best highlight key relationships
- Find drill downs that establish or break relationships

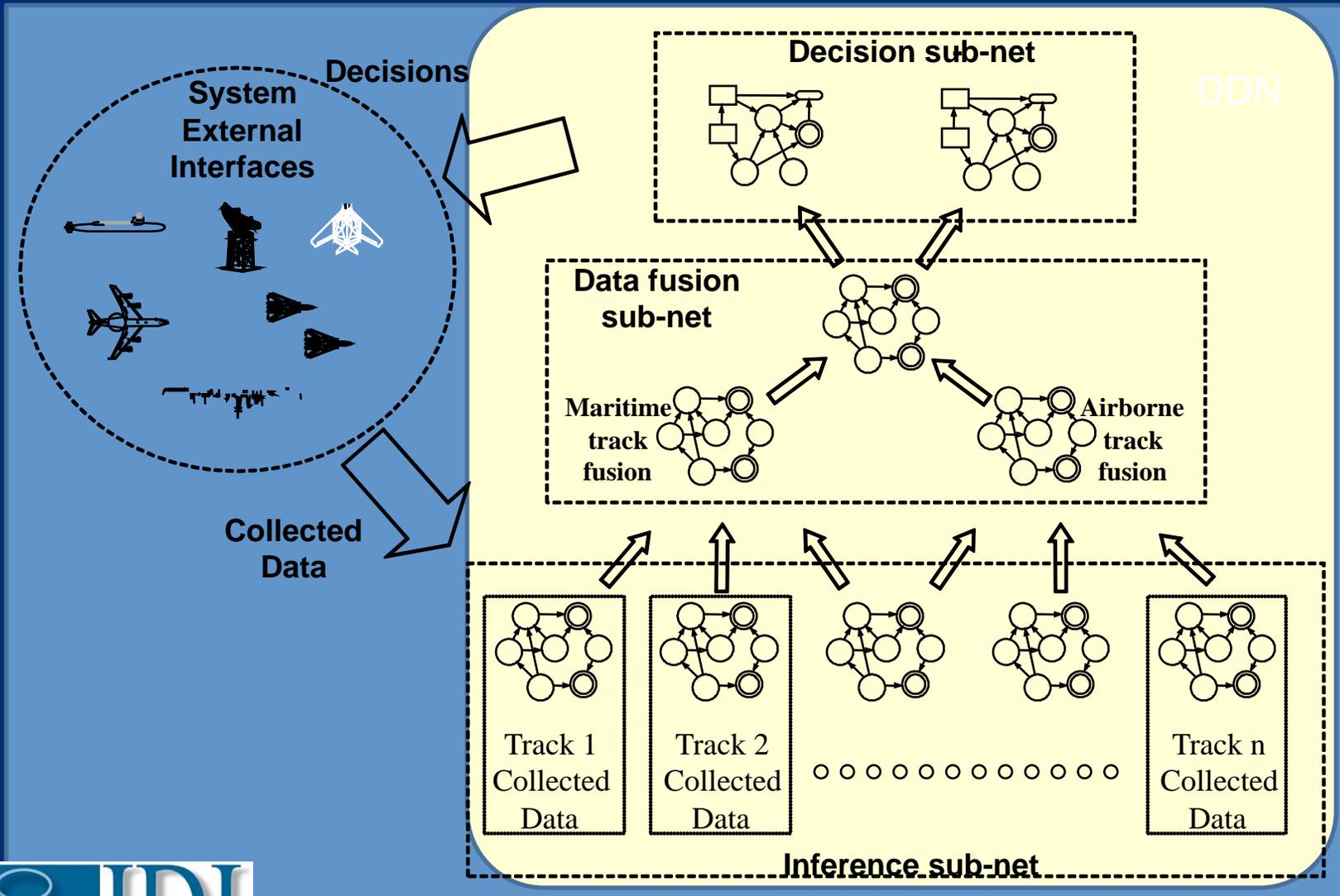


# A problem: How to create intelligent BOTS?

- Our approach uses DDNs
  - DDNs extend Bayesian nets and influence diagrams
    - Handle value trade offs
    - Address uncertainty and fusion of many sensor reports
  - They address repetitive decisions
    - Provide performance appropriate responses to Avatar queries
    - Send game change instructions to the Game Engine based on Avatar performance and stress levels
  - DDNs suggest a decision at each step based on
    - Deterministic information about the game purpose and available resources
    - Probabilistic information about the Avatar's performance and stress
    - The game goals and objectives we are trying to achieve
  - This approach has been applied to decisions encountered by unmanned ground and aerial vehicles of the Army's Future Combat System (FCS)



# Full Representation of a DDN



# BOT Activities for Serious Games

## Basic Activities

- Respond to Avatar queries, based on Avatar performance
- Play a role (e.g., intel officer, cultural anthropologist) for the Avatar
- Change the Game's environment in predefined ways
- Change the Game's rules in predefined ways

## Advanced Activities

- Critique the Avatar during and after the Game
- Act as therapist for Avatar, during and after the Game
- Send suggestions to Game designers
- Learn how to improve performance by updating probabilistic relationships after human experts critique game performance