



Inertial Navigation Data Simulator

Lockheed Martin

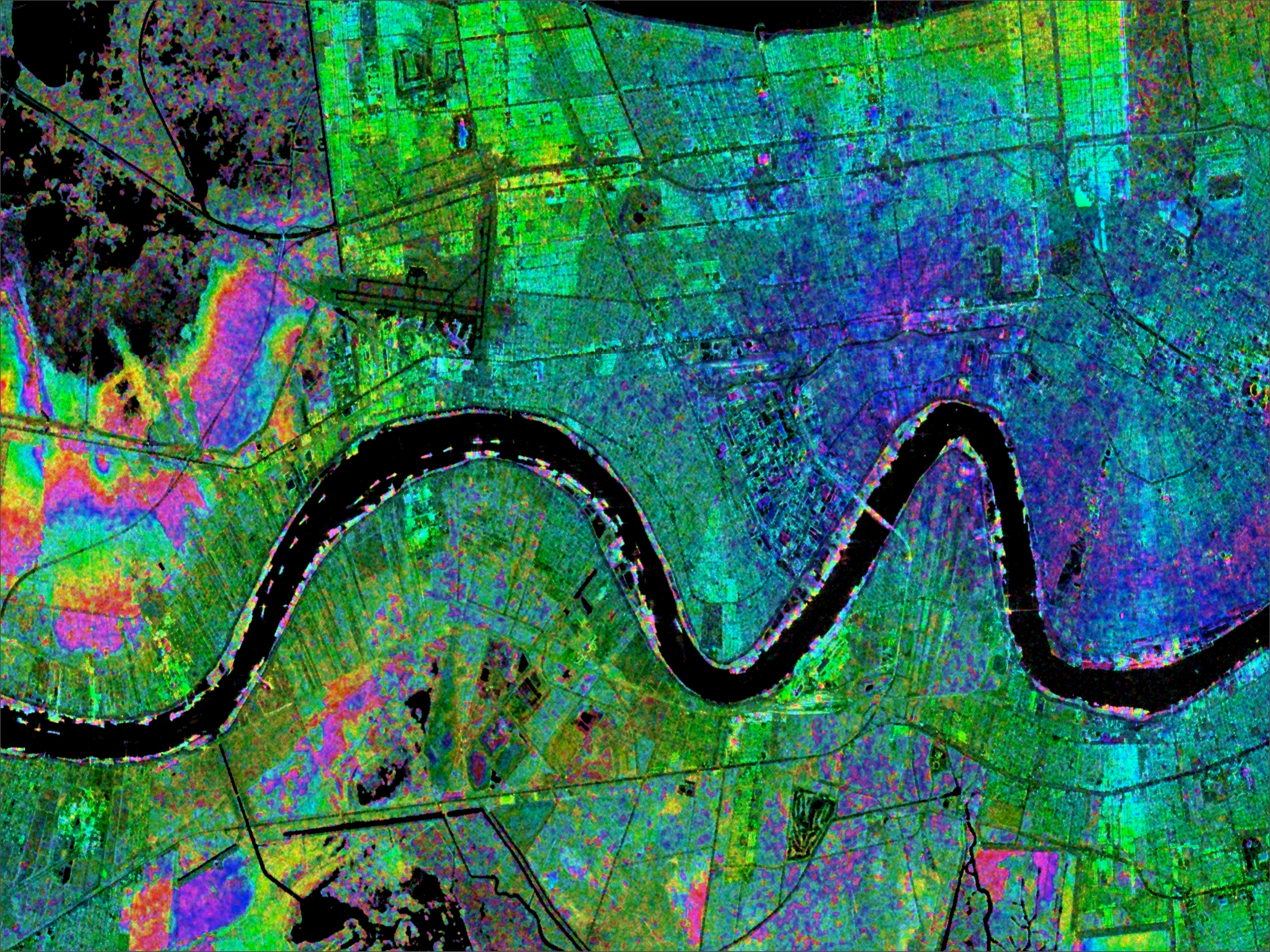
David Smith

Mike Kasper

Ryan Raub

An aerial night photograph of a city, likely in the Southeastern United States, showing a prominent winding river. The city lights are visible, with a significant portion of the illumination appearing in shades of green and blue, possibly due to specific lighting or image processing. The river is dark, creating a stark contrast with the illuminated urban areas.

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SAR Testing

A Synthetic Aperture Radar (SAR) image showing a river bend. The river is represented by a dark, winding path through a textured, multi-colored landscape. The colors range from dark blue and purple to green and yellow, indicating different surface characteristics or vegetation. The image is presented in a false-color format.

An aerial photograph of a river delta, likely the Nile Delta, showing a complex network of waterways and land parcels. A dark grid is overlaid on the image, representing a cadastral or land management system. The text 'Room for improvement' is centered in white.

Room for improvement

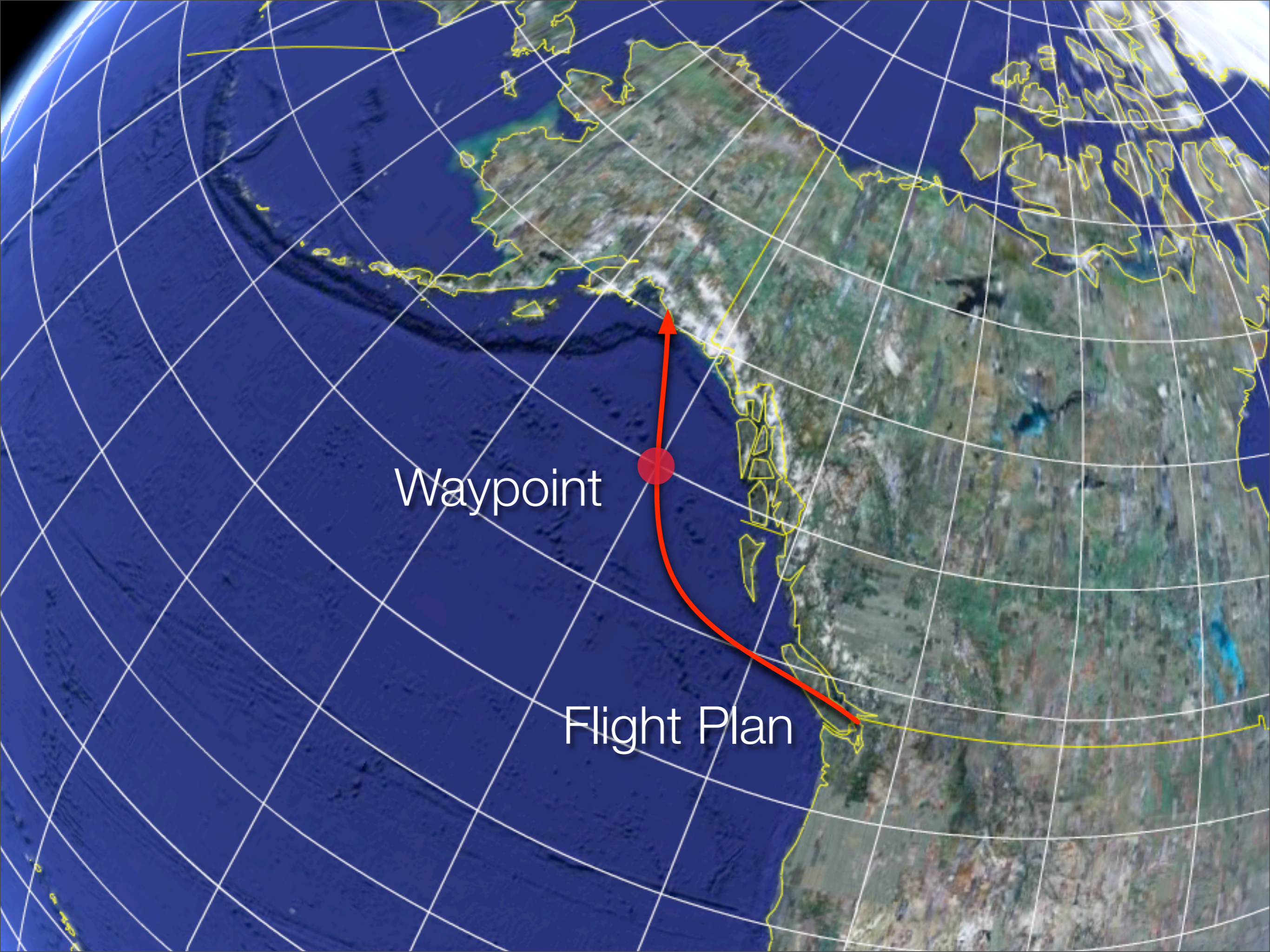
An aerial photograph of a river delta, likely the Nile Delta, showing a complex network of waterways and land parcels. A dark grid is overlaid on the image, representing a spatial or data grid. The colors are primarily dark green and blue, with some purple and yellow highlights. The text "How does testing work?" is centered in white.

How does testing work?



Waypoint

Flight Plan



Waypoint

Flight Plan



Latitude

Waypoint

Flight Plan



Latitude

Waypoint

Flight Plan

Longitude

The Design

Design Paradigm

- ✦ Iterative
- ✦ Unit Testing

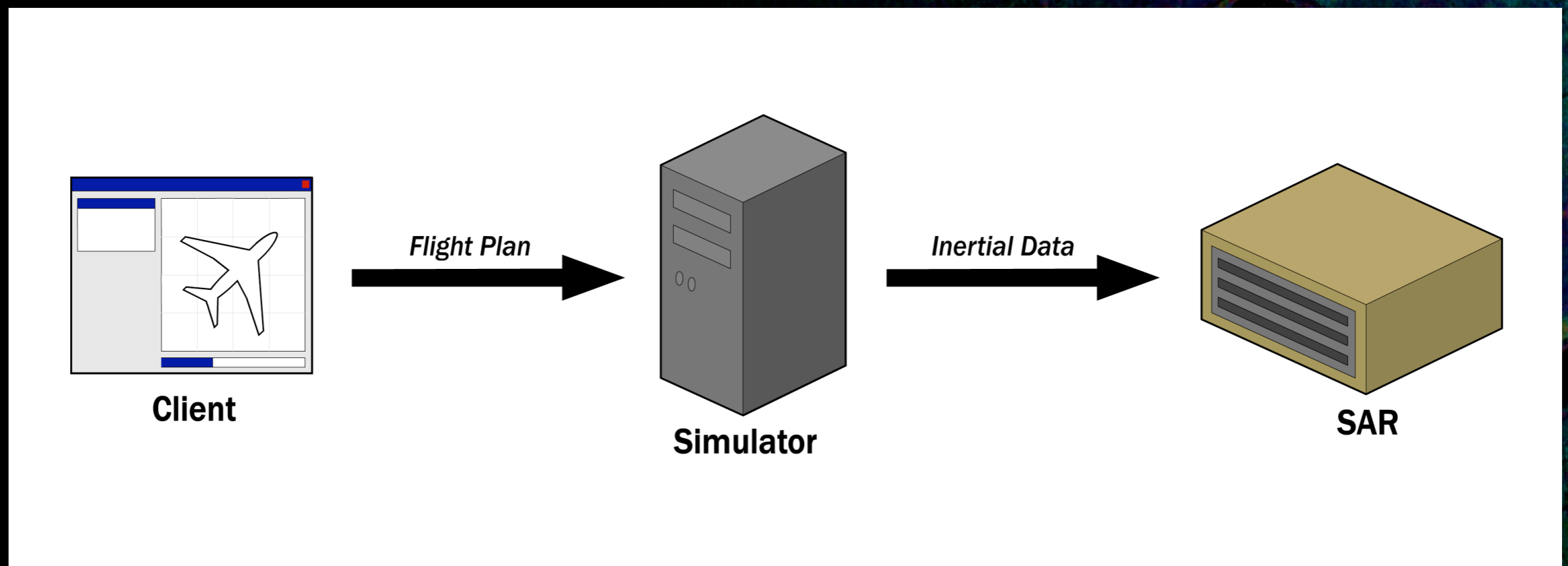
Usability Testing

- ✦ Expert Reviews
- ✦ Moderated Testing
- ✦ Performance Testing

Architecture

- ✦ Java
- ✦ Modular
- ✦ Client Server Model

Architecture



Simulator

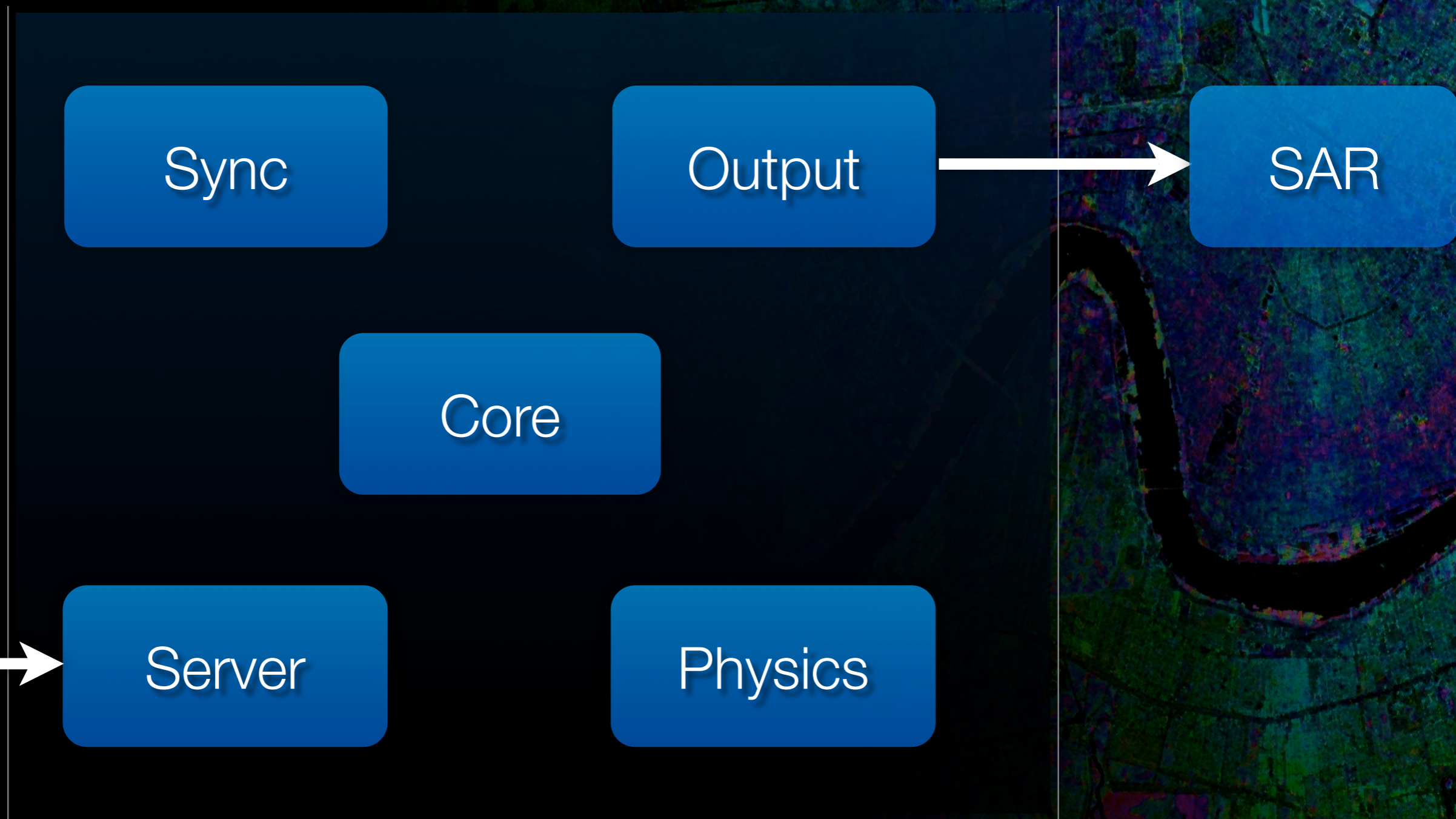
The background of the slide is a complex, colorful pattern. It features a grid of small squares, with colors ranging from dark blue and green to bright yellow and red. A prominent, thick, black, curved shape, resembling a stylized 'S' or a path, winds through the center of the image. The overall effect is that of a digital simulation or a data visualization.

Simulator Functionalities

- ✦ General Inertial Data
- ✦ Accurate Physics Arithmetic

- ✦ Variable Sync Rates
- ✦ Modular Output Options

Simulator

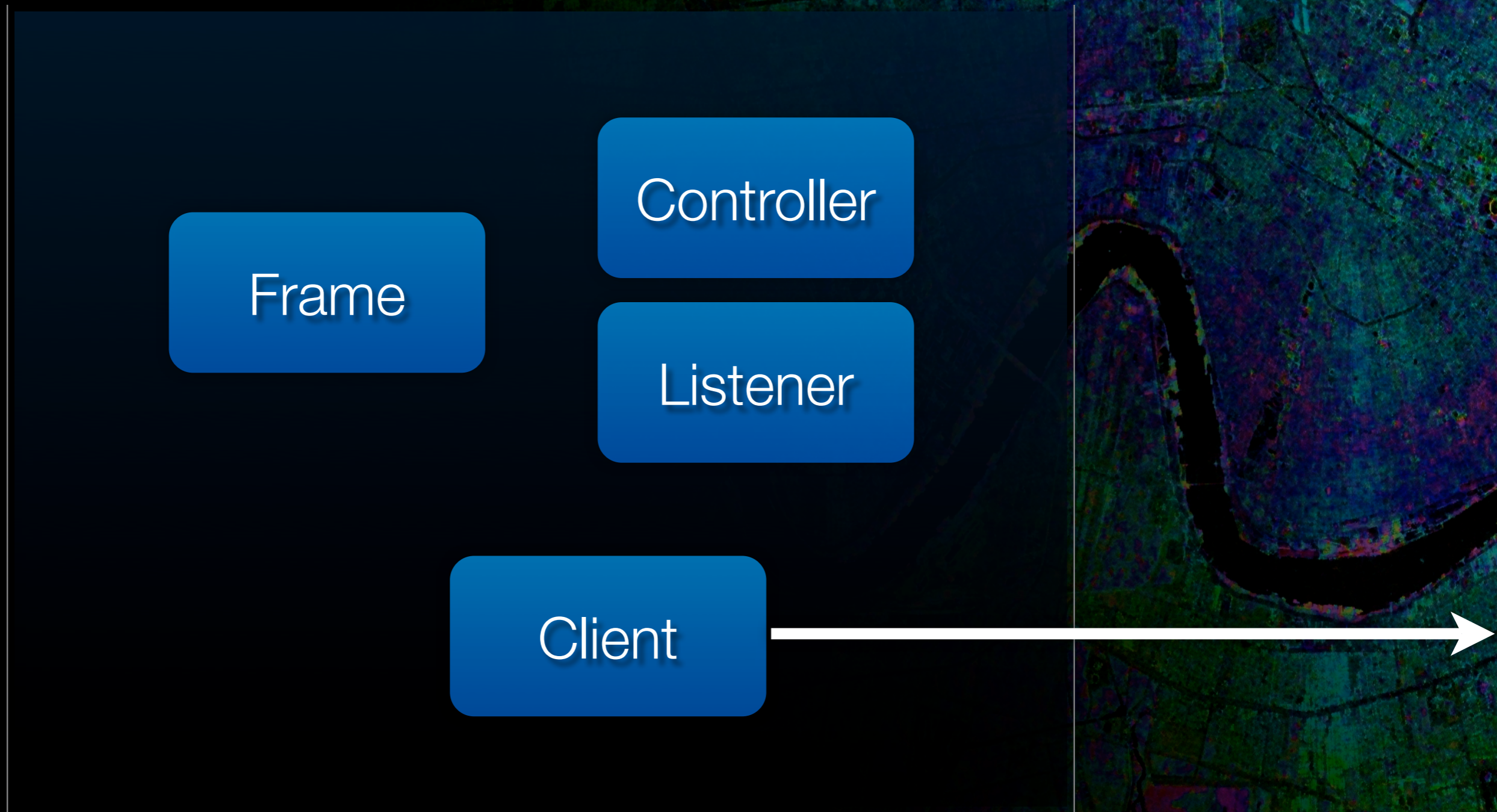


Client

Client Functionalities

- ✦ Remote Connection
- ✦ Manage Flight Plan
- ✦ Visual Display
- ✦ File I/O
- ✦ Flight Control

Client/GUI



Client

Inertial Navigation Data Simulator - flight1.wyp

File Edit Control View

Waypoints

#	LAT	LON	ALT	VEL
1	0.0	0.0	9000.0	600.0
2	10.0	10.0	9000.0	600.0
3	12.0	25.0	9000.0	600.0
4	20.0	32.0	9000.0	600.0

Buttons: Add..., Edit..., Remove, Up, Down

Status

Location

Latitude: **4.543N**
Longitude: **4.543E**
Altitude: **9000ft**

Orientation

Roll: **0.0°**
Pitch: **0.0°**
Yaw: **0.0°**

Velocity

Set Step:

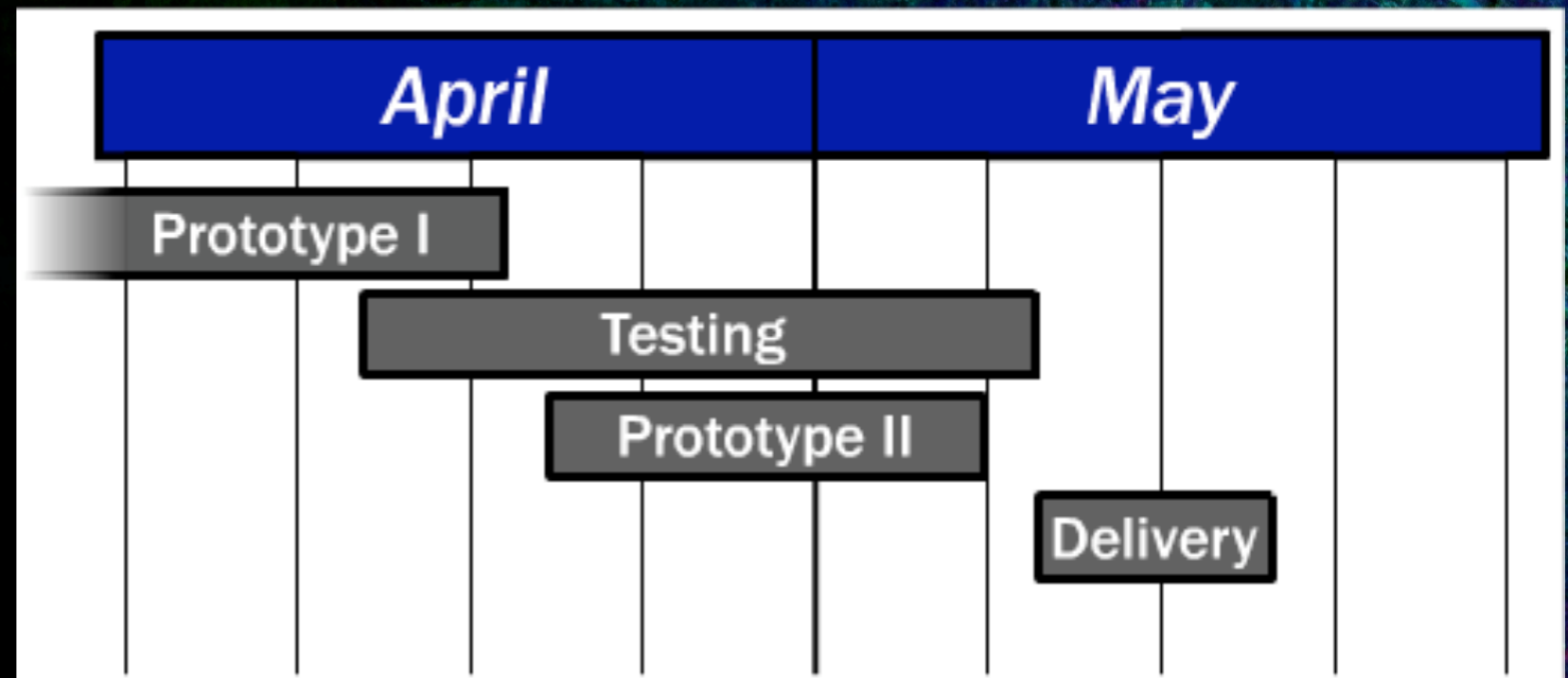
Buttons: Pause, Reset

0hr 16m 40s / 0hr 50m 0s

Challenges

- ✦ Coordination
- ✦ Domain Knowledge
- ✦ Testing
- ✦ Time Restrictions

Time Line



<i>February</i>	<i>March</i>
<ul style="list-style-type: none">- Derived Specifications- Designed Architecture- Initial Development	<ul style="list-style-type: none">- GUI Design- Implementation

Current Progress

- ✦ Testing
- ✦ Prototype Iterations

Conclusion

- ✦ Improved SAR Testing
- ✦ Flexible Design

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Poster

Ballroom A, #47

1:00 pm - 2:30 pm