

Automated Vehicle Routing



S&T Campaign: Sciences for Maneuver Vehicle Intelligence

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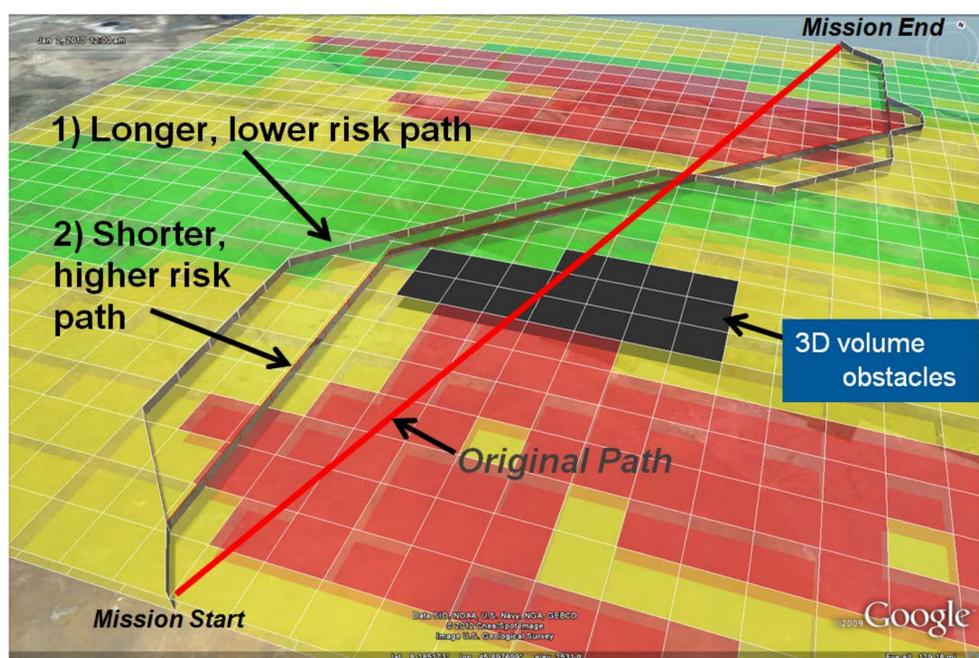
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Research Objective

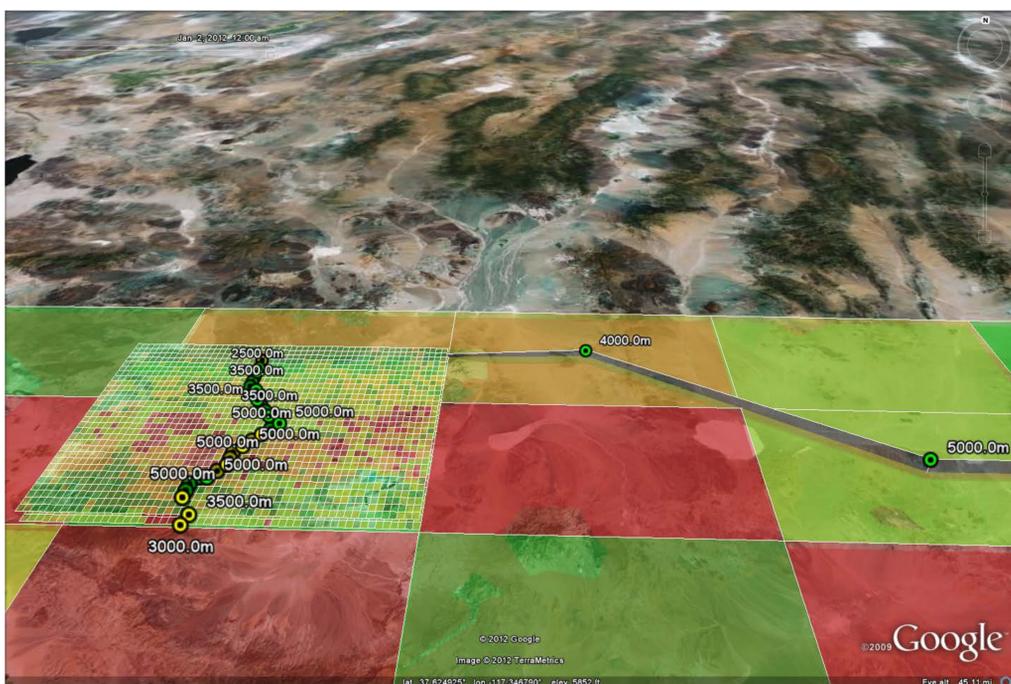
- Provide optimized air and ground movement solutions through complex adverse environments, impacts, or conditions at all echelons using ARL-developed Automated Impacts Routing (AIR) technology



Optimized 4D flight path(s) output in Google Maps/Earth KML format

Challenges

- Application of technology to dynamic (spatial and temporal) 4D data sets
- Develop as fast/efficient execution web service and standalone desktop applications



Asynchronous multi-path calculations at varying resolutions from multiple web service requests

ARL Facilities and Capabilities Available to Support Collaborative Research

- ARL White Sands Missile Range (WSMR) web application servers and in-house cluster
- ARL WSMR expertise in computer modeling and atmospheric science
- References/Patent:
 - Brandt, et al., "Second Generation Weather Impacts Decision Aid Applications and Web Services Overview," ARL-TR-6525, Jul 2013
 - Brandt, et al., "Second Generation Weather Impacts Decision Aid User's Manual," ARL-TR-6620, Sep 2013
 - Johnson, Jeffrey O., "Atmospheric Impacts Routing (AIR)," ARL-TR-5792, Nov 2011
 - US Patent application: Johnson, Jeffrey O., "Software Design and Implementation of Optimized Routing to Avoid Adverse Conditions and Obstacles in 3D Space," 2013
- Tests, validation, and verification show fast/efficient execution against complex input data sets
- Web service allows asynchronous solutions of varying input grid resolutions

Complementary Expertise/ Facilities/ Capabilities Sought in Collaboration

- Existing NRL collaboration including work with University of Connecticut (UConn) and University of Southern California (USC)
- Seeking access to simulated operational environment. Currently collaborating with Tactical Airspace Integration System (TAIS) to determine possible access to TAIS simulated operational environment - this will allow elevation of AIR's Technology Readiness Level (TRL) to transition to operational deployment
- Seeking operational testing and deployment of AIR technology. Seeking collaboration with Air Force Weather Agency (AFWA) – Web Service (AFW-WEBS) for testing and deployment of AIR web service technology within AFW-WEBS
- In process of collaborating with US Forest Service for deployment of AIR technology on US Forest Service web application servers