GIS Practicum Project Ideas

Anyone should feel free to add or change any part of this document.

Semi-Intelligent Vehicle Navigation and Virtual Imaging

1. Hardware and Software
   1. ArcGIS
   2. CityEngine
   3. Oculus GO
   4. nVidia JetBot ( possibly XAVIER )
   5. Autonomous Vehicle (drone or car)
   6. Location sensing hardware
      1. Possibly/hopefully LIDAR
      2. IR
      3. 2D RGB (1080p ?)
      4. 360 Camera ?
      5. FLIR ?
   7. Possibly WiFi
   8. Possibly Bluetooth
2. General Use Case Description
   1. Autonomous vehicle (either drone or car)
      1. Drone might be too much for first implementation
   2. Capable of intelligent autonomous navigation to one or more fixed points both indoors and outdoors
      1. Wide to Close
      2. Maze solving solution
   3. Takes a 3D image at preselected condition
      1. Location
      2. Flight time
      3. Unsolvable obstacle
   4. Image is processed using ESRI tools on a PC or in the cloud
      1. Stored on a flash card
      2. Possibly WiFi capable
   5. Output is in format supported by Oculus GO
   6. Can navigate to multiple locations depending on travel time / battery
3. Specific Use Case Scenarios
   1. Could be used to provide a quick 360 degree view of any location
      1. Flying drone could be used to assess a disaster location
         1. Set the desired location for the imaging to be in the center of a collapsed building, implement the maze finding algorithm - will map a route to the location
         2. Set the desired location above a disaster location to give Command and Control personnel and first responders enhanced informational capabilities
      2. Car or Tracked vehicle with maze solving could be used to get to difficult locations
      3. Flying drone might be used at sporting events, amusement parks, political rallies, parades, fairs, etc to provide an elevated 3D Virtual environment that could be overlaid with any desired GIS info and maps
   2. Inventory Control in a Warehouse Environment
      1. Would likely require a wireless charging solution to fully automate