GGS416 Group Research Project using Satellite Image Analysis

To succeed in GGS416 it is important to submit a high-quality group research project on a topic of your choosing. This coursework will consist of each group submitting a single research paper, along with the code being pushed to a public GitHub repository, for examination in tandem. The aim of this exercise is for each participant to understand and apply the basic processing steps required to use satellite imagery in a piece of analytical research, thereby achieving the course learning objectives.

To recap, the learning objectives for GGS416 are as follows:

1. Understand practical computer programming techniques for processing satellite imagery.
2. Develop introductory Python-based approaches for object detection and extraction.
3. Utilize introductory JavaScript for running image processing tasks using cloud computing.

Groups are allowed to choose whichever programing method best suites their topic. Seek advice if you are unsure which path to take. Indeed, plenty of time is allocated in the course to help refine these projects. In fact, the exercises set each week can be seen as preparatory steps for the research project. Tasks set in class will complement the necessary processing steps for your chosen topic.

Students are advised to consider this exercise as a piece of work which constitutes a potential job market paper, consequently demonstrating your competence when applying for future positions beyond GMU.

The project requirements include:

- Submission of a 6,000-8,000-word research paper which utilizes satellite image analysis techniques.
- Groups of 3-4 participants, with students being allowed to organize into their own groups. It is advised these groups sit together in class for ease of collaboration.
- The paper should be submitted on MyMason BlackBoard (as both a Microsoft word (.docx) and pdf document), and also uploaded to a GitHub repository with the developed code. LaTeX/MarkDown documents can also be submitted if you prefer, just make sure to also provide a .pdf file of the final submission.

The paper needs to include:

- A properly written research abstract which summarizes the paper, including the motivation, research question, results, and findings (<250 words).
- An introductory section which provides background information, the motivation for the analysis and a stated research question(s) which the analysis aims to answer (<500 words).
- A comprehensive literature review on your chosen topic summarizing past theoretical and empirical research in this area (2,000 words).
- A high-quality methodology section which details the data sources and processing steps involved in the analysis (1,000-2,000 words). This must include a box diagram illustrating the sequencing of the processing steps, from input data to results output.
- Fully written-up results of the satellite image analysis undertaken, including graphs or other data plots, and if necessary, any example imagery (1,000-2,000 words).
- A discussion section which evaluates the ramifications of the results in relation to the research question(s) specified in the introduction (1,000-2,000 words). Areas of future research could also be discussed. There must be a subsection on the limitations of the analysis.
- A conclusion section containing a summary of the purpose of the paper, and then the main findings (~500 words).