GeoAI: Sharing Experiences and Challenges from Spatial Data Generation to Spatio-temporal Knowledge Discovery

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Abstract: Geospatial technologies in the last decade has been adopted for various tasks, ranging from its use for consumer applications like LBS to Governance related activities to enhanced use in a range of scientific domains. The later has led to the need for increased geospatial content like recognizing and extracting core spatial objects like roads and buildings, better representation of the terrain and its features, vegetation monitoring especially response to the environment, climatic and disease patterns etc. Simultaneously, the rapid developments in data science including AI/ML, deep learning (DL) and access to high powered computing, opens up new vistas for their integration with geospatial sciences and geospatial knowledge discovery – GeoAI.

In my talk, I would like to share my experiences in adopting the AI/ML/DL methods to the area of geospatial sciences and technology development in reference to the application domain. While there is increasing work in use of ML/DL in building and road detection from satellite imagery, I will share how DL methods can be applied to super-resolve the DEM datasets – a key thematic layer. Further in the talk, will highlight how temporal patterns aggregated over space of agricultural crop growth can give us important clues on the resource constraints and response to extreme events in the Earth system. And finally, will talk of how an in-house developed spatio-temporal data mining method can give new insights to the system performance, temporal consistencies of behavior, help better classify the spatial regions. I hope sharing these research works will help open up the discussion on how AI can be better integrated into Geospatial sciences, being aware of the challenges and requirements that each of the domain areas pose.