

The Way Forward in Global-Scale AI:

The Trillion-Pixel GeoAI Challenge

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The emergence of virtually ubiquitous global imagery, astonishing progress in artificial intelligence (AI), and transformational advances in high performance computing are converging to create unprecedented detail in mapping and interpreting the surface of our planet.

Rapid innovations in satellite and airborne remote sensing capabilities will soon collect high-resolution imagery with daily, even hourly, return rates. This offers the possibility of detailed change detection and new insights into how humans occupy, interact, and alter the planet's surface over time. Implications for science, policy, and security are extraordinary.

However, this opportunity is a modern-day moonshot for science and technology. Depending on resolution, the number of pixels required to image the surface of the earth is easily in the trillions. Processing, exploiting, and interpreting this amount of data will require a massive scaling of AI workflows and advances in generalizing those to accommodate highly heterogeneous conditions.

As a pre-requisite for future global imagery processing, we pose the Trillion-Pixel GeoAI Challenge: *What are the barriers, opportunities, and way forward in exploiting high-resolution planetary imagery involving hundreds of trillions of pixels?* We invite you to join us for an interdisciplinary gathering of experts from image science, computer vision, high performance computing, architecture, machine learning, advanced workflows, and societal AI challenges for this workshop focused on the Trillion-Pixel GeoAI Challenge. The objective is to imagine and shape how we as a community might approach this challenge while remaining mindful of the societal impacts and issues.