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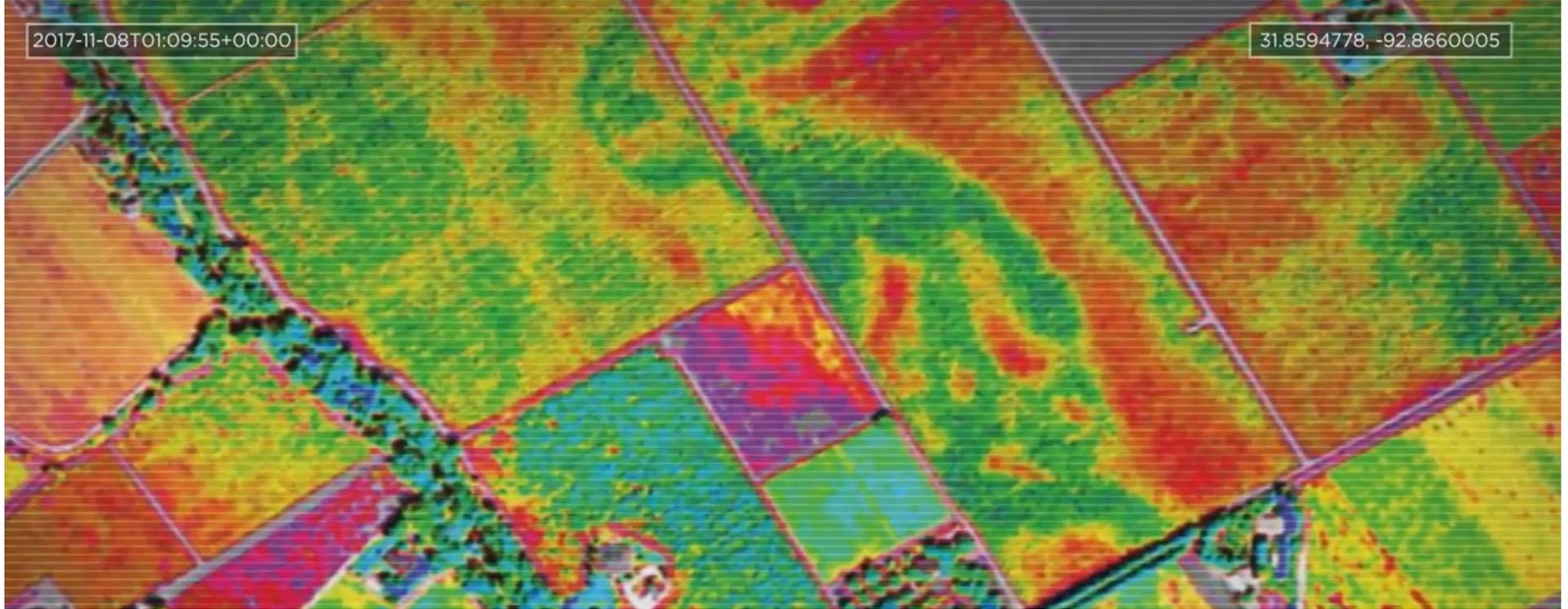
North Carolina State University

Harnessing Artificial Intelligence and big data to solve pressing societal issues

Thanks to access to the Lenovo Artificial Intelligence (AI) Innovation Center, researchers at NC State University are pushing the boundaries of geospatial research – all in pursuit of answers to some of the biggest challenges we face in the 21st century.

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North Carolina State University, a leading US public research university, is home to more than 34,000 undergraduate and graduate students who learn by doing. A powerhouse in science, technology, engineering and math, NCSU supports ground-breaking research across a range of disciplines.

The Center for Geospatial Analytics at NCSU is the foremost interdisciplinary research and teaching center of its kind in the United States – discovering, interpreting and communicating meaningful patterns in location-based data, which can include satellite images, temperature records, soil moisture levels and even social media posts.

Dr. Raju Vatsavai, Associate Director of Spatial Computing and Technology at NCSU, begins: “Around 70% of data collected worldwide is spatial and temporal data. This means that the data contains both X and Y coordinates, such as latitude and longitude, and a timestamp of when the observation took place. Our job is to sift through spatiotemporal datasets to find patterns that can help us better understand everything from large-scale climate events like floods, droughts and wildfires, to crop yields.

“The spatiotemporal datasets that we need to analyze are very large and heterogenous. Traditional machine learning algorithms cannot deal with these high dimensional heterogenous datasets. AI and deep learning technologies are perfectly suited to this type of work, but demand high computational resources and expertise that are in shortage.

“Due to academic funding limitations, it’s becoming harder and harder for centers like ours to buy high-performance computers with the latest technology. And that’s where Lenovo comes in.”

Through a collaboration, Dr. Raju Vatsavai and his team now have access to the newly available Lenovo Artificial Intelligence Innovation Center, located in Morrisville, NC. The Lenovo AI Innovation Center is kitted out with a wide array of high-performance computing resources, including the latest Lenovo ThinkSystem servers which are equipped with Intel® Xeon® Scalable processors and offer next-level performance.

“Being able to access such powerful computing resources optimized for AI is fantastic, and means that researchers can run more data analyses faster, accelerating projects,” says Dr. Raju Vatsavai. “Having access not just to the Lenovo technology, but also to Lenovo’s expertise, is extremely valuable. They helped us to develop new algorithms that will enable us to analyze many more data streams in near real time.”

With help from Lenovo, the Center for Geospatial Analytics is taking advantage of AI to tackle some of the biggest challenges of our age.

Dr. Raju Vatsavai gives an example: “Geospatial research has the potential to revolutionize farming practices. According to UN estimates, the world’s population is set to grow by 3 billion by 2050. This means that we need to double food production in the next 30 years. But it’s not as simple as just increasing production - we have a limited amount of land and, crucially, a limited supply of water with which to do so. We already use 70% of the Earth’s freshwater for agriculture. To feed the growing global population, we need to get the very most out of our limited natural resources.

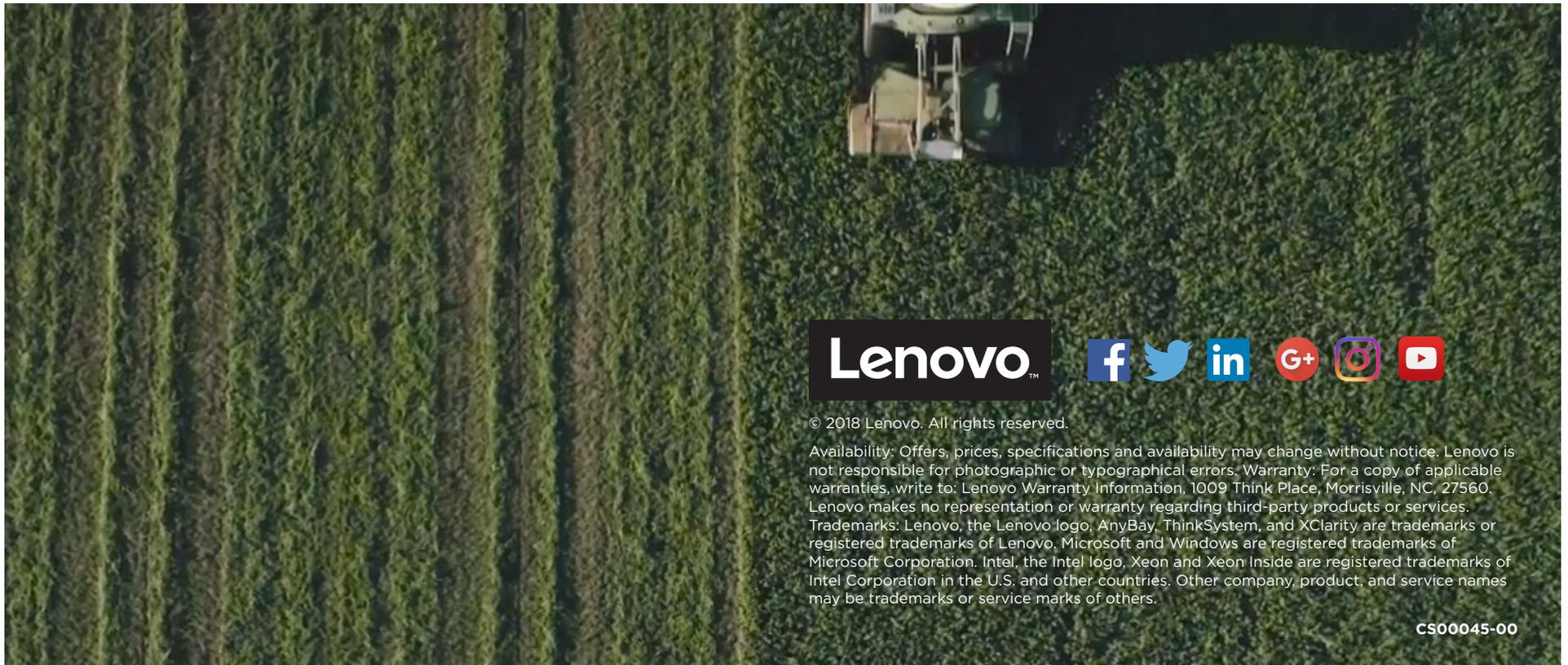


“Our hope is that with new AI capabilities, we can analyze sensor data from farms across the US and, based on regional weather patterns, predict the best time to irrigate crops to minimize wastage and misutilization of water supplies, boosting efficiency.”

He concludes: “Supported by Lenovo, we can process and analyze spatiotemporal data faster, get results quicker, and apply exciting new AI and big data technologies to solve real global problems. Behind all the number-crunching, it’s about changing the world.”

“Having access not just to the Lenovo technology, but also to Lenovo’s expertise, is extremely valuable.”

- Dr. Raju Vatsavai, Associate Director of Spatial Computing and Technology, NC State University



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Solution components

Hardware

Lenovo ThinkSystem with
Intel® Xeon® Scalable
processors

Services

Lenovo AI Innovation Center
Services

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—Dr. Raju Vatsavai, Associate Director of Spatial Computing and Technology, NC State University

NC State University teamed up with Lenovo to give researchers at its renowned Center for Geospatial Analytics access to the powerful supercomputing facilities at Lenovo Artificial Intelligence Innovation Center in Morrisville, NC. Cutting-edge HPC resources have given research a boost, helping the university find answers to major global challenges.



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