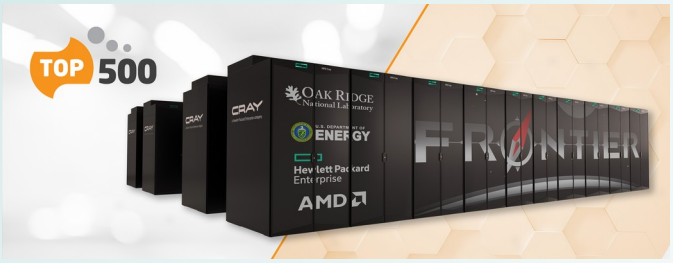
ECE 415/515 in Fall 2025:
Parallel Computing for High-Performance Data Analytics

Dr. Masha Sosonkina – Instructor

CRNs from 21842 to 21847

COURSE DESCRIPTION



→ Introduction to parallel computing principles and architecture; machine-learning (ML-Ai) at large scale; platforms considered:
supercomputer, GPU, and Cloud computing

→ Modeling of parallel application performance

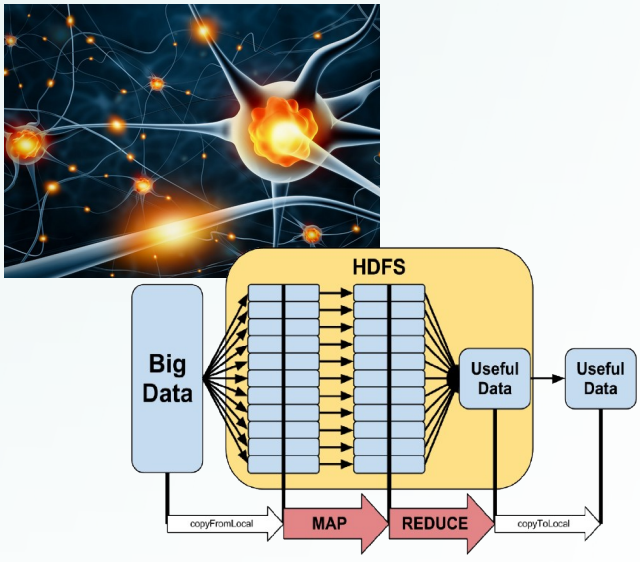
→ Hands-on experience with ODU on-campus computational clusters and remote Cloud resources

→ Case studies of engineering simulations, data-science applications and ML-Ai model execution

Students will apply the gained knowledge in course project.

SELECTED COURSE TOPICS

→ Programming models: shared memory with **OpenMP**, message-passing with **MPI**, **Map-Reduce, Spark, Kubernetes**
→ Metrics to analyze performance and scaling
→ Best practices in parallel computing and ML-A computing
→ Orchestration of data-analytics applications



PREREQUISITES

Experience with a high-level programming language, such as C, C++, or Python

For more information, please contact Dr. Sosonkina at *msosonki@odu.edu*