



Channel Islands
CALIFORNIA STATE UNIVERSITY

TidalForce HPC

California State University Channel Islands

Irvin Ortiz-Cortez, Salam Khalaf, Maxwell Scharkopf, Julian Nemo, Kieron Roe, Danil Zanozin



Meet the team!



Maxwell Scharkopf
Computer Science



Irvin Ortiz-Cortez
Computer Science



Julian Nemo
Computer Science



Danil Zanozin
Computer Science



Kieron Roe
Computer Science



Salam Khalaf
Mechatronics Engineering



Resource Management

We use Ubuntu Linux for its compatibility with HPC tools and a Slurm resource manager to efficiently schedule and monitor jobs.

OpenMPI and GCC serve as our primary compilers for performance benchmarking and parallel workloads. We conduct experiments on Jetstream2, using virtual clusters and customized images to simulate competition conditions.

All configurations and tests are tracked through Git repositories and shared documentation to ensure consistency and collaboration. We are evaluating file system options on Jetstream2 to optimize I/O performance and balance speed with reliability during large-scale workloads. This structured approach to configuration and resource tracking ensures transparency, scalability, and efficient use of allocated systems.

System reliability	Performance optimization	Coordination & documentation	Algorithmic optimization	AI integration & leadership	Hardware/software integration
Server management, automation, networking	MPI, HPL/HPCG, SLURM	Scripting, HPC benchmarks	C++, Python, Math modeling	ML pipelines, project coordination	Mechatronics, data analytics, cybersecurity

Focus

Key Skills

Team Introduction

Tidal Force represents California State University Channel Islands, a Hispanic-Serving Institution committed to access, inclusion, and opportunity.

Our team brings together six members from four nationalities, including Latin American, Middle Eastern, and Eastern European backgrounds, spanning Computer Science, Mechatronics Engineering, and IT. Half of us are first-generation college students breaking barriers for our families and communities.

We combine diverse expertise from benchmark optimization on Frontier during the 2025 Winter Classic Invitational to competitive programming, AI deployment, and system administration. This mix of cultural and technical perspectives fuels creativity, adaptability, and collaboration.

Together, we aim to demonstrate that first-time competitors from underrepresented backgrounds can thrive and excel at the highest levels of high-performance computing when given the opportunity.

Preparation & Strategy

Our preparation for IndySCC 2025 focuses on teamwork, experimentation, and shared learning. We meet weekly to plan tasks, review progress, and troubleshoot as a team.

Two members gained hands-on HPC experience during the 2025 Winter Classic Invitational, where they optimized HPL and HPCG benchmarks on Frontier. Their expertise guides our internal training and benchmark testing on Jetstream2 and local virtual clusters.

Each member specializes in a core area such as performance tuning, system reliability, SLURM scheduling, or profiling tools, while cross-training ensures no single point of failure. This structure builds both depth and versatility across the team.

We also receive institutional support through career workshops and technical communication training from CSU Channel Islands, strengthening our collaboration and presentation skills.

Our strategy emphasizes consistency, documentation, and inclusivity, ensuring that every member contributes meaningfully while preparing for competition-level challenges.

Institutional Support

Our IT department and faculty mentors collaborate to offer computing resources, mentorship, and access to donated HPC servers from TACC and UCSB, which our students are assembling into an educational cluster. This hands-on environment strengthens both technical and teamwork skills.

We also receive support from the Career Center and Writing & Multiliteracy Center, which provide workshops on professional communication and networking. Campus spaces and advising resources ensure that students can balance competition work with academic and personal commitments.

Educational Goals & Future Impact

Our goal is to gain hands-on experience configuring, optimizing, and managing high-performance computing systems while strengthening collaboration and communication under real-world conditions. We aim to develop practical skills in benchmarking, system tuning, resource management, and problem-solving, preparing us for future roles in research and industry.

Beyond technical growth, we hope to build a lasting HPC community at CSU Channel Islands, mentoring future teams and expanding opportunities for students from underrepresented and first-generation backgrounds.

Through IndySCC, we aspire to inspire others on our campus to explore advanced computing and to continue growing diversity and inclusion in the field of HPC.