Focus Topic Session

Challenges in Extreme Engineering Algorithms

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- Aircraft design
- Helicopter Design
- Building Design
Challenges

Algorithms must
• usually solve time-dependent and non-linear problems
• be robust
• be highly accurate
• be scalable

Software frameworks must
• exploit hardware parallelism on several levels
• be tunable for heterogeneous computer systems
• support load balancing
• be easily to maintain

Coupling of several application components
→ Convergence challenges
→ Scalability challenges
→ Load balancing challenges
→ Communication challenges
Presentations

Coupling Rotor Dynamics with a Parallel Airflow Simulation
Johannes Hofmann
Research Engineer, Institute of Flight Systems, German Aerospace Center

Extreme Simulations on ppOpen-HPC
Prof. Dr. Kengo Nakajima
Professor, Supercomputing Research Division, Information Technology Center, University of Tokyo