Jeremie Meurisse

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LEAD SOFTWARE ENGINEER

Predictive AI/ML | Scalable HPC Solutions | Technical Leadership & Strategy | Research & Innovation

Innovative software engineer with 9 years of experience developing predictive simulation platforms and integrating AI/ML to optimize workflows and advance research. 7 years of team management experience in end-to-end product development, consistently delivering results in fast-paced, dynamic environments. Analytical, data-driven professional skilled in anticipating needs, solving complex challenges, and driving technological advancements. Articulate leader with proven success in fostering collaboration, managing stakeholder relationships, and effectively communicating intricate information to diverse audiences.

Core Competencies & Technical Skills:

AI/ML Integration • Distributed HPC Engineering • Scalable System Design & Architecture • Cloud Computing & Infrastructure
Technical Vision & Execution • Product Strategy • Data Analytics & Validation • Software Quality Assurance & Deployment
C/C++ • Python • AI Platforms (PyTorch, TensorFlow, Modulus) • Cloud Platforms (GCP, AWS) • Docker & Kubernetes • CI/CD

PROFESSIONAL EXPERIENCE

NASA Ames Research Center, CA: Entry Systems & Technology Division **2015 – Present**

LEAD SOFTWARE ENGINEER – AMA, Inc. (Jan 2024 – Present) **Allocation:** 80% Software + 20% Management

Lead strategic initiatives to advance predictive simulation platforms and foster adoption through cross-functional collaboration.

- **AI/ML Engineering**: Train PINNs to develop surrogate models for statistical analysis and fine-tune GPT-NeoX 1.3B generative AI model to create chatbot for tool documentation. Engage in latest AI/ML training sessions, workshops, and conferences.
- **Software Development:** Lead the complete lifecycle of 6 simulation software products from conception through launch. Manage feature integration, code optimization, rigorous testing, and transition to open-source platforms to enhance product quality and performance. Drive impactful, large-scale HPC simulations that deliver critical insights for NASA.
- **Scalable HPC Solutions:** Develop robust software systems to transform petabytes of sensor data into actionable metrics, validating engineering tools and ensuring their reliability to support NASA's data-driven decision-making processes.
- **Leadership & Management:** Shape and execute strategic roadmaps for 5 concurrent NASA projects, aligning with organizational objectives and stakeholder expectations while optimizing resources for timely delivery. Drive collaboration with 100+ external partners, building tools and solutions that enhance workflows and accelerate research and innovation.
- **Research & Innovation:** Lead applied science projects in physics-based modeling, building scalable software to boost NASA research and missions. Collaborate with multidisciplinary teams to drive R&D breakthroughs. Published 19 journal papers and presented at 21 leading conferences using large-scale simulation data to drive scientific advancements.

SENIOR SOFTWARE ENGINEER – AMA, Inc. (Nov 2020 – Jan 2024) **Allocation:** 90% Software + 10% Management

Led technical team developing predictive simulation platforms for critical NASA missions, delivering innovative software, enhancing UX, and building open-source infrastructure to advance scalable HPC solutions and foster strategic partnerships.

- **AI/ML Engineering**: Directed development of DL segmentation tools for video (arcjetCV) and 3D imaging data (TomoSAM), accelerating data analysis by 50x. Facilitated collaborative sessions with external experts, elevating team proficiency in ML.
- **Software Development**: Led development of PATO, R&D platform in C/C++ for entry systems, coordinating with 100+ developers and 200+ users. Expanded testing protocols to ensure ongoing software integrity. Improved UX by integrating conda packages, HPC modules, user & hands-on guides, Google Cloud integration, and SQL web database using Django. Released PATO as open-source by collaborating with cross-functional teams and navigating government paperwork.
- **Scalable HPC Solutions:** Leveraged petabytes of experimental data from NASA facilities equipped with advanced sensors to validate simulation outputs, ensuring tool reliability and providing critical insights for NASA mission decisions.
- **Leadership & Management:** Led 8-engineer team across 12 projects, directing code development, research, milestones, and long-term planning. Secured $3M in research funding, coordinated with leadership, managed team administration, organized 30 annual visits for professors and students, and established 2 international agreements with research institutes.
- **Research & Innovation:** Developed novel multiscale physics-based models to address key NASA challenges including ablation, micro-CT analysis, particle tracking, solid mechanics, turbulence, hypersonic CFD, radiation, and plasma physics.

SOFTWARE ENGINEER – STC & UIUC (Jan 2016 – Oct 2020) **Allocation:** 95% Software + 5% Management

Led development of 2 simulation platforms in C/C++ from scratch, including feature integration, testing frameworks, and model verification & validation through rigorous experiments. Managed engineering team, delivering high-quality, scalable solutions.

- **Software Development:** Designed and implemented PATO and ARCHeS (arc heater digital twin) for modeling entry systems. Developed a tailored testing framework integrated with CI/CD, ensuring high-quality, automated tests. Created unit and regression tests while supporting developers by maintaining code integrity and promptly addressing issues.
- **Scalable HPC Solutions:** Executed and debugged MPI simulations on NASA Supercomputer, utilizing over 10M CPU core-hours to optimize performance and scalability. Validated simulations by analyzing petabytes of experimental and flight data, performing statistical analysis to ensure accurate predictions that support NASA's data-driven mission decisions.
- **Leadership & Management:** Led team of 4 engineers, setting milestones and securing funding to ensure project success.
- **Research & Innovation:** Optimized ARCHeS with GPU using CUDA/Kokkos during NVIDIA hackathon, enhancing 3D radiation model performance by 100x. Created Python tools for enhanced visualization, optimization, and multi-physics integration.

SOFTWARE ENGINEER INTERN – UIUC (Jun 2015 – Dec 2015) **Allocation:** 80% Software + 20% Hardware

Executed projects on CubeSat constellation for solar observation and developed critical software for space weather missions.

- **Software Development:** Implemented embedded flight software in C/C++ to manage CubeSat science data during flight. Developed Python ground control interface, used successfully in an Antarctica balloon test to calibrate high X-ray detector.
- **Research & Innovation:** Authored detailed document on small satellites for solar observations, including large science matrix summarizing CubeSat instruments, presented to Heliophysics experts at NASA for further space weather analysis.

INDEPENDENT PROJECTS

Drone Club **2016 – 2018**

- **Leadership:** Founded 5-member club to design and build drones using CAD tools, 3D printer, and commercial components.
- **Software Development:** Created C/C++ flight software. Tested drones in field and debugged flight software in real time.

Mars Desert Research Station **2013 – 2015**

- **Leadership:** Established analog mission club and secured $15K in funding to send 6 members to Utah Desert station.
- **Technical Design:** Designed and 3D-printed drone for studying communication relay in Utah desert for future Mars mission.
- **Software Development:** Developed C/C++ flight software utilizing open-source libraries and tested at drone facility.

CubeSat Design **2013 – 2015**

- **Software Development:** Developed embedded flight software in C/C++ for IMU of QB50 CubeSat in collaboration with ONERA & CNES, contributing to successful deployment from ISS and transmission of flight data during atmospheric reentry.

EDUCATION

Master of Science in Aerospace Engineering, ISAE-Supaero (2013 – 2015).
Bachelor & Master of Science in Electromechanical Engineering, UCLouvain-EPL (2009 – 2013).

LEADERSHIP

Led technical section for $40M ESTRAD contract proposal, securing competitive positioning (2023 – Present).
Member of AMA Awards Panel (2023 – Present).
Authored proposals securing 4 NASA-funded projects, totaling $3M in grants (2017 – Present).
Published 19 journal/conference papers and presented at 21 scientific conferences (2015 – Present).
President of 4 student associations (2009 – 2015).

AWARDS

NASA Software of the Year (2022) | NASA Early Career Public Achievement Medal (2020)