Assistive Technology Development, Inc.

Principal Robotics Software Research Engineer

ATDev

At ATDev we are creating an ecosystem of mobility devices to enable independence for the elderly and disabled, no matter their level of physical ability. Over 15 million people require in-home care due to physical disabilities and the need for home care is expected to double by 2040 as the average age of populations around the world increases. Along with rising costs, there are not enough caregivers to meet these demands. We are developing unique robotic mobility systems to meet the world's growing needs.

To change this, ATDev - together with leading academic and industry partners - is creating **RAMMP**, the *Robotic Assistive Mobility and Manipulation Platform*, powered by **ATOS**, an open-source assistive technology operating system, and **RAMMS**, a high-fidelity digital twin and simulation environment. This platform will serve as the foundation for future assistive mobility robots, advanced manipulation systems, and next-generation AI-enabled autonomy capabilities.

We are seeking a **Principal Robotics Software Research Engineer** to serve as the **technical architect and research leader** for ATDev's robotics software stack. This is a senior technical leadership role responsible for **defining software architecture, proposing and directing research programs, and guiding the technical execution of learning-enabled robotic systems** across simulation, embedded platforms, and deployed products.

This role sits above Senior and Staff engineering levels and is expected to shape **long-term technical strategy**, **research direction**, and **system-level design decisions** across ATDev's platforms and products.

The Principal Robotics Software Research Engineer is the **technical authority** for robotics software at ATDev. They will:
- Architect and evolve the **end-to-end software systems** for ATOS, RAMMS, and commercial robotic products
- Propose, lead, and direct **multi-year research + development efforts** in learning-enabled mobility and manipulation
- Act as a **PI-level technical leader** for internal, collaborative, and externally funded research projects
- Translate cutting-edge research into **robust, safety-critical, deployable systems and products**
- Mentor and guide Senior and Staff engineers who execute research and development initiatives

This role combines **hands-on research**, **system architecture**, and **technical leadership**, and requires deep experience across robotics, embedded systems, AI/ML, and large-scale software platforms.

Key Responsibilities

System Architecture & Technical Strategy
- Define and own the **software architecture** for:
    - ATDev's commercial robotic mobility and manipulation products, their software and associated services
    - **ATOS** (distributed, safety-critical robotics middleware)
    - **RAMMS** (high-fidelity simulation, digital twin, and HIL platform)
- Establish architectural principles for:
    - real-time and mixed-criticality systems
    - fault isolation and safety

- o simulation-to-real transfer
- o scalable autonomy and learning pipelines
- Ensure architectural consistency across embedded devices, edge computers, cloud services, and mobile applications.

Research Leadership & Direction
- Propose, define, and lead **software-centric robotics research and development programs**, including:
  - o learning-enabled mobility and manipulation
  - o shared autonomy and user intent modeling
  - o perception, sensor fusion, and multimodal learning
  - o simulation-driven learning and evaluation
- Act as **technical PI or co-PI** on internal and external research efforts (e.g., government-funded programs, academic collaborations).
- Break high-level research and product-development goals into **coherent technical roadmaps** executed by Senior and Staff engineering leads.
- Ensure research outputs are measurable, testable, and aligned with real-world deployment.

Hands-On Research & Development
- Personally conduct advanced research and development in areas of strategic importance.
- Implement and validate algorithms derived from research literature, including:
  - o modern robot learning approaches
  - o perception and computer vision pipelines
  - o planning, coordination, and control systems
- Lead complex investigations where architectural decisions, algorithmic tradeoffs, and safety considerations intersect.

Simulation, Evaluation & Real-World Deployment
- Oversee the integration of learning-based systems into **RAMMS** for evaluation, benchmarking, and data generation.
- Define evaluation frameworks and metrics for autonomy, safety, performance, and usability.
- Guide translation of simulation-validated systems into **real-world robotic hardware**.
- Ensure feedback loops between simulation, hardware-in-the-loop, and deployed systems.

Technical Leadership & Mentorship
- Provide technical direction and mentorship to Senior and Staff Robotics Software Engineers.
- Review system designs, research plans, and critical implementations.
- Establish best practices for research software quality, testing, documentation, and reproducibility.
- Serve as a key technical advisor to leadership on feasibility, risk, and long-term strategy.

Collaboration & Cross-Functional Work
- Collaborate with academic partners (CMU, Pitt, NEU, Cornell, Purdue, Vanderbilt), industry partners (Nvidia, AWS, Kinova, LUCI), and internal teams at ATDev.
- Communicate system behaviors, research findings, and technical insights to engineers, scientists, leadership, and stakeholders.

About You

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- **PhD** in Robotics, Computer Science, Electrical Engineering, Mechanical Engineering, or a closely related field.
- **10+ years** of experience in robotics software, research, or advanced engineering roles.
- Prior experience acting as **Principal Investigator (PI)** or technical lead on software-centric projects.
- Demonstrated expertise across:
    - real-time and embedded systems
    - robotics (mobility and/or manipulation)
    - computer vision and perception
    - machine learning and learning-based control
    - large-scale software architecture
- Expert-level proficiency in:
    - **C / C++**
    - **Python**
- Strong track record of translating research into working systems (not just publications). This should include successful product launches, ideally in regulated industries such as medical devices.
- Excellent written and verbal communication skills, including the ability to articulate complex technical concepts to diverse audiences.
- Organized, self-directed, and comfortable driving research and development with minimal oversight.
- Collaborative and empathetic - excited to build technologies that materially improve quality of life for people with disabilities.
- Thrives in dynamic, exploratory, fast-paced research environments.

Breadth of Technical Experience (Expected)
- Real-time embedded platforms (e.g., FreeRTOS, RTOS-based systems, embedded linux)
- Embedded linux for real-time robotics, including u-boot, PREEMPT_RT, and rootfs
- Distributed robotic systems and middleware
- Simulation and digital twin environments
- Hardware-in-the-loop and system validation
- Mobile and edge computing platforms
- Computer vision and sensor fusion
- Learning-based robotics (RL, imitation learning, hybrid approaches)
- Safety-critical or medical device software (preferred)
- Experience bridging academic research and commercial product development

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Preferred Experience (Nice-to-Have)
- Leadership in open-source robotics or systems software
- Experience with assistive robotics, medical robotics, or human-centered robotics
- Prior involvement in ARPA, DARPA, NIH, or similar research programs

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Why Join Us?
- Work on a mission-driven project that will dramatically improve independence and autonomy for people with disabilities.
- Contribute to a groundbreaking open-source ecosystem for assistive robotics.
- Collaborate with world-leading robotics research institutions and engineers.
- Tackle hard problems spanning perception, learning, simulation, mobility, manipulation, and user-centered robotics.

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- Help build a unified, scalable platform that will shape the future of assistive robotic mobility and manipulation.

This role defines *how* ATDev builds robotics software—today and a decade from now. The Principal Robotics Software Research Engineer will shape the **technical foundations** of an open, extensible platform that enables researchers, developers, and users to build safer, smarter, and more capable assistive robots.

If you are motivated by **hard technical problems**, **system-level thinking**, and **real-world impact**, this role offers the opportunity to lead at the highest technical level while directly improving the independence and quality of life for people with disabilities.

To apply: send cover letter, resume, and portfolio/website (if available) to apply@assistivetech.dev