Terms of Reference (ToR)
Robotics Fellow (R&D)

About the Fellowship

The Robotics Fellow will focus on research, experimentation, prototyping, and technical documentation of Arduino-based robotics systems.

Working closely with the Robotics Program team, the fellow will develop and test hardware setups, explore sensors and control systems, and produce structured documentation to support future robotics curriculum and program development.

This is a short-term, research-oriented role aimed at strengthening the technical ecosystem of the robotics program.

Position Details

- **Position Title:** Robotics Fellow (R&D)
- **Number of Positions:** 1
- **Reporting To:** Robotics Program Team

Key Responsibilities

1. Research & Development (Primary Responsibility)

- Research Arduino-based robotics systems suitable for school-level education.
- Design, build, and test robot prototypes using Arduino microcontrollers and commonly available components.
- Experiment with hardware configurations, including:
  - Sensors (ultrasonic, IR, line sensors, etc.)
  - Motor drivers and actuators
  - Communication modules
  - Coding platforms
- Evaluate the performance, reliability, and cost-effectiveness of different setups.
- Identify opportunities to replace or complement existing robotics kits with locally available components.
- Test robotics systems under classroom and competition-like conditions.

2. Prototyping and System Development

- Develop working prototypes such as:
    - Line-following robots
    - Obstacle detection robots
    - Object handling mechanisms
    - Other educational robotics models
- Improve hardware stability, power management, and wiring reliability.
- Contribute to modular robotics system design for easier assembly and troubleshooting.

3. Technical Documentation

- Prepare clear, structured technical documentation, including:
    - Circuit diagrams
    - Code repositories
    - Assembly guides
    - Component lists and sourcing details
    - Troubleshooting manuals
- Develop step-by-step guides for teachers and students.
- Document research findings, testing results, and lessons learned.

4. Knowledge Sharing & Technical Support

- Share research insights with the robotics program team.
- Provide technical inputs to improve:
    - Robotics curriculum
    - Competition design
    - Hardware reliability
- Support testing of new robotics models before deployment in schools or competitions.

5. Contribution to Program Innovation

- Explore innovative approaches for:
    - Low-cost robotics education
    - Locally sourced components
    - Simplified robotics kits for schools
- Contribute ideas for future robotics modules, challenges, and activities.

Expected Deliverables

By the end of the fellowship, the fellow will deliver:

- Arduino-based robotics prototypes
- Technical documentation and assembly guides
- Source code and circuit diagrams
- Testing reports and performance analysis
- Recommendations for improving the robotics hardware ecosystem

Requirements

Educational Background

- Bachelor's degree (or final-year student) in:
    - Electronics Engineering
    - Mechatronics
    - Robotics
    - Computer Engineering
    - Electrical Engineering
    - Or related STEM fields

Technical Skills

- Basic to intermediate experience with:
    - Arduino microcontrollers
    - Embedded programming (Arduino IDE / C++)
    - Electronic circuit design and prototyping
    - Sensors and actuators
    - Motor control systems
- Familiarity with:
    - Breadboards and prototyping tools
    - Electronics debugging
- Knowledge of version control (Git) is an advantage

Personal Attributes

- Strong curiosity and interest in experimental engineering
- Ability to clearly document technical work
- Problem-solving mindset
- Ability to work independently and collaboratively
- Interest in STEM education and school-level robotics

Application Process

Interested applicants should submit:

- Cover letter
- Resume
- Relevant project portfolio (GitHub, project reports, or robotics work)

Email: jobs@olenepal.org
Subject Line: Robotics Fellow (R&D)