Research & Innovation Internship

Duration: 6 months (part-time)
Department: Research & Innovation (R&D)
Location: Hybrid (remote with one mandatory on-site day per week)
Weekly Commitment: 12–16 hours per week (flexible to accommodate academic schedules)
Mandatory On-Site Day: One day per week, choice of 5:00 PM–10:00 PM or 2:00 PM–6:30 PM for lab work, mentorship, and workshops

1. Role Overview

The Research & Innovation Intern will support Cypher's Research & Development team by conducting structured research, designing and executing experiments, developing prototypes, and contributing to the innovation pipeline. This role is suited for students passionate about applied research, problem-solving, and translating ideas into validated concepts for product development. Interns will work under the guidance of experienced R&D professionals, gaining hands-on experience in a dynamic, interdisciplinary environment.

2. Responsibilities

A. Ongoing Responsibilities (Weekly)

- Participate in weekly R&D team standups and attend the mandatory on-site day for collaborative work, lab activities, and mentorship.
- Conduct and maintain literature and prior-art reviews for assigned research topics, summarizing findings in an organized format.
- Maintain a detailed research log, including notes, experimental protocols, and data references.
- Assist in data collection, preprocessing, and exploratory analysis for ongoing experiments.
- Prepare concise technical memos and slide updates for the R&D Lead.
- Track and report progress on assigned experiments, prototypes, or validation tasks.

B. Project-Based Responsibilities (Milestone-Driven)

- Perform structured market and technology landscape analyses for designated problem areas.
- Design simple experiments or validation plans under mentor supervision.
- Develop or support low-fidelity prototypes, such as hardware mockups, software proofs-of-concept, or simulations.
- Conduct user, field, or lab tests, collecting and synthesizing feedback and data.

- Create and document reproducible datasets, code notebooks, or analysis outputs for team handover.
- Deliver a comprehensive research output, including a technical report, presentation, and actionable recommendations for next steps.

C. Ad-Hoc Responsibilities

- Assist with procurement, bill of materials (BOM) preparation, and lab setup for experiments.
- Support the organization and facilitation of technical workshops or demo days.
- Contribute to patent and prior-art searches, as well as basic intellectual property (IP) documentation, under supervision.
- Help develop or refine internal innovation documentation, such as process templates and playbooks.

3. Learning Objectives

The internship is designed to provide practical experience and professional development in the following areas:

Research Fundamentals

- Learn to structure comprehensive literature reviews and summarize prior art effectively.
- Formulate hypotheses, design experiments, and apply principles of reproducibility.
- Understand basic statistical methods and interpret experimental results (e.g., confidence intervals, statistical tests).

Technical and Practical Skills

- Gain hands-on experience with prototyping techniques, such as electronics breadboarding, CAD sketches, or software proof-of-concept development, depending on project needs.
- Develop proficiency in data handling and exploratory analysis using tools like spreadsheets or Python/CSV notebooks.
- Learn versioned documentation and reproducible research practices using platforms like Git, notebooks, or shared drives.
- Plan and execute test cases, defining acceptance criteria and logging results accurately.

Innovation and Product Readiness

- Translate research findings into actionable product opportunities and roadmaps.

- Write clear, concise technical reports and communicate results to both technical and non-technical stakeholders.
- Understand the basics of IP awareness, prior-art searches, and documentation for potential inventions.

Professional Skills

- Enhance structured problem-solving, critical thinking, and scientific communication skills.
- Develop time management skills to balance multiple experiments and research tasks.
- Build collaboration skills by working with cross-functional teams, including product, design, quality assurance, and manufacturing.

4. Deliverables and Expectations

Key Deliverables

- A comprehensive literature or prior-art review with annotated references and key insights.
- Experimental plans and protocols for at least two small-scale validation tasks.
- Reproducible datasets, analysis artifacts (e.g., spreadsheets, code notebooks), and documented raw and processed data.
- A low-fidelity prototype or proof-of-concept, such as a physical mockup, software demo, or simulation, where applicable.
- A technical report and slide deck summarizing research findings, limitations, and recommended next steps.
- A capstone presentation demonstrating an end-to-end research cycle (problem definition, validation, and recommendations).

Performance Expectations

- Maintain clear, versioned documentation and adhere to data hygiene standards.
- Provide timely updates through weekly reports and transparently document experimental outcomes, including failures and lessons learned.
- Demonstrate professional collaboration and openness to iterative feedback from mentors.
- Comply with lab safety protocols, confidentiality agreements, and IP policies.

5. Support Provided by Cypher

- Structured onboarding and ongoing mentorship through regular one-on-one meetings with an R&D Lead.

- Access to company resources, including datasets, prototyping tools, lab facilities, and design/engineering communication channels.
- Training sessions on research methodologies, experimental design, and relevant tools.
- Opportunities to co-author internal whitepapers, contribute to demos, or assist in prototype development.
- A certificate of completion and a written performance reference upon successful completion.
- Priority consideration for future internships, project roles, or full-time opportunities at Cypher.
- A competitive stipend and, if applicable, reasonable travel support (details provided during hiring).

6. Evaluation and Milestones

Evaluation Cadence

- **Weeks 1–2**: Onboarding, topic assignment, and initial literature review framework established.
- **Months 1–2**: Complete literature review and propose 1–2 experimental plans.
- **Months 2–4**: Execute experiments, build prototypes, and conduct iterative testing and analysis.
- **Months 4–5**: Consolidate results and refine prototypes or recommendations.
- **Month 6**: Deliver final technical report, capstone presentation, and handover materials.

Evaluation Criteria

- Rigor, clarity, and organization of literature and prior-art summaries.
- Quality, reproducibility, and documentation of experimental protocols and data.
- Actionability of research recommendations and their alignment with product development goals.
- Effectiveness in collaboration, documentation hygiene, and adherence to timelines.
- Demonstrated growth in research skills and application of feedback throughout the internship.

7. Eligibility and Qualifications

Preferred Qualifications

- Current enrollment in an undergraduate or graduate program in a relevant field (e.g., Engineering, Physics, Computer Science, Electrical Engineering, Mechatronics, Industrial Design, or related).
- Basic experience with experimental work, coursework projects, or academic research.
- Proficiency with Google Workspace and basic data tools (e.g., spreadsheets).

- Demonstrated interest in applied research, prototyping, or product innovation.

8. Policies and Expectations

- Interns must sign a standard confidentiality and intellectual property agreement to access proprietary project materials.
- Strict adherence to lab safety protocols and procedures is required during on-site activities.
- Professional conduct is expected during workshops, meetings, and all interactions.
- Flexible accommodations for academic commitments (e.g., exams) may be arranged with prior notice.
- All deliverables must be stored in Cypher's project repositories with clear versioning and documentation.