Project Semester 5 (IoT)

**Career Development Plan**

Project Title: < **Using Agile with micro:bit Robot Robot Control** >

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# 1. Career Development Plan

In this section you should present a short career development plan. The four stages used in the lectures should be used and presented in the following four sections.

## 1.1. Personal Audit

## Technical Skills:

## Strengths: Proficient in Python programming for embedded systems; hands-on experience with micro:bit hardware control, motor drivers, and basic robotics logic. Familiar with the Agile development methodology, specifically the Scrum framework, for iterative project management. Experienced in using Git and GitHub for version control and collaborative coding. Strong practical problem-solving skills.

## Areas for Development: Limited experience with complex sensor data fusion, advanced path-planning algorithms, and deep optimization of embedded system performance. Knowledge of large-scale IoT platform architecture needs to be expanded.

Soft Skills:

Strengths: Effective communication and collaboration within a team setting; able to articulate ideas clearly and incorporate feedback. Improved time management and task prioritization through sprint planning. Capable of delivering project demonstrations.

Areas for Development: Experience in leading cross-functional teams and formal project risk management is limited. Public speaking and technical writing skills can be further refined.

## 1.2. Goal Setting

## Short-Term (1-2 years): Secure a position as a Junior Embedded Systems Engineer or IoT Software Developer at a technology company focused on robotics, automation, or smart devices. The goal is to contribute to product development cycles and gain industry experience.

## Medium-Term (3-5 years): Advance to a Senior Engineer or Technical Lead role, responsible for architectural decisions on medium-scale projects. Aim to specialize in an area such as autonomous systems or edge computing.

## Long-Term (5+ years): Attain a position as a Technology Architect or Engineering Manager, guiding technology strategy and leading a team to develop innovative IoT solutions.

## 1.3. Planning

## Education: Complete the current IoT degree with a strong academic record. Pursue online certifications in Advanced Python, Embedded C++, and Scrum Master (PSM I) within the next 18 months.

## Skill Development:

## Technical: Develop a more complex personal project using Raspberry Pi/Arduino with computer vision (OpenCV) to strengthen algorithm skills. Contribute to an open-source robotics project on GitHub.

## Professional: Attend at least two industry conferences or workshops annually to network and stay current with trends. Practice technical writing by publishing project documentation or blog posts.

## Experience: Target internships or entry-level roles in companies working on embedded systems. Actively seek mentorship from senior engineers.

## 1.4. Execution

# Immediate Actions (Next 6 months):

# Finalize and excel in the Micro:bit Robot project, ensuring the GitHub repository is well-documented to serve as a portfolio piece.

# Enroll in and complete an "Advanced Python for Robotics" online course.

# Update LinkedIn profile and CV to reflect project experience and skills.

# Ongoing Actions:

# Dedicate 5 hours per week to learning new technologies and practicing coding.

# Apply for at least three relevant internships before the end of the semester.

# Request feedback from peers and professors on collaborative and technical skills after each project.

# 2. Company Profile

In this section you should present a profile of a company of interest to you who seem to be active in a relevant area to your IoT project artefact. The company could be deemed as a potential employer.

## 2.1. Company Overview, Values and Culture

## Company: Boston Dynamics

## Overview: Boston Dynamics is a world-leading engineering and robotics design company famous for creating highly mobile and dynamic robots like Spot, Atlas, and Stretch. They focus on building robots that solve tough challenges in real-world environments.

## Values & Culture: The culture is rooted in innovation, engineering excellence, and solving the impossible. They value curiosity, interdisciplinary collaboration, and a practical, hands-on approach to turning groundbreaking ideas into reality. The work environment is fast-paced and results-driven. 2.2. Products and Intellectual Property

## Products: Their primary products are advanced mobile robots. Spot® is an agile quadruped robot for industrial inspection and data collection. Atlas® is a humanoid robot pushing the boundaries of locomotion and dexterity. Stretch™ is a robot designed for warehouse automation.

## IP: The company's core intellectual property lies in its sophisticated dynamic control, balance, and locomotion software algorithms, which are protected by numerous patents. Their hardware design is also a significant asset.

## 2.3. Industry Trends, Environment and Competitors

# Industry Trends: The robotics industry is rapidly growing, driven by trends in automation, AI integration, and the need for operations in hazardous or complex environments. There is increasing demand for robots in logistics, manufacturing, and healthcare.

# Competitors: Key competitors include iRobot (consumer-focused), Fanuc and KUKA (industrial automation), and newer startups like Agility Robotics. Boston Dynamics competes by focusing on advanced mobility and manipulation that others cannot match.

# 3. Reflections on Company Suitability for Future Employment

# Boston Dynamics would be an exceptional fit for my long-term career goals. My experience with the fundamentals of robotics programming and Agile methodology on the micro:bit project provides a foundational understanding that aligns with the company's core work. I am deeply motivated by their mission to create robots that operate dynamically in the real world. While my current skills are at an entry-level, my career plan is designed to build the advanced expertise in algorithms and embedded systems that Boston Dynamics requires. The company's culture of innovation and engineering excellence is exactly the environment I believe will foster my maximum growth and contribution.

# 4. Preliminary Business Plan

# Company Name: Amber Robotics Solutions

# Product/Service: Developing customizable, educational, and light-industrial robotic kits and solutions based on platforms like micro:bit and Raspberry Pi.

# Value Proposition: To provide affordable, modular, and programmable robotics platforms for STEM education and small-scale automation prototypes.

# Marketing & Sales: Direct online sales, partnerships with schools and vocational training centers, and a strong online presence with tutorial content to build a community.

# Staffing: Initially, a core team of 2-3 engineers (including myself). Hire expertise in marketing and industrial design as the company grows.

# Funding: Seek seed funding from startup grants, angel investors focused on EdTech, and launch a Kickstarter campaign for the first product kit.

# SWOT Analysis:

# Strengths: Low-cost, high educational value, modular design.

# Weaknesses: Limited brand recognition, small initial team.

# Opportunities: Growing global emphasis on STEM education and SME automation.

# 4. Threats: Competition from established educational robotics companies (e.g., LEGO Mindstorms, VEX Robotics).

# 5. Online CV and Digital Portfolio

* Github Portfolio: <https://github.com/xab901>

*Reflection: The GitHub repository for this project is my primary digital portfolio piece. It is well-organized with clear documentation, a detailed*[*README.md*](https://readme.md/)*file explaining the project, and a commit history that demonstrates my iterative development process and collaboration skills. I will continue to add more projects to showcase a growing range of skills.*