

SDP Individual Performance Report 3

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Group 7

I. INTRODUCTION

For the third milestone, I upgraded the LeJOS firmware and library to the new version, wrote an initial odometry-based fallback navigation to the initial position, stress-tested the whole system and measured its load using the YourKit profiler, and prepared a solution for the milestone from some parts of the existing Strategy code.

II. CONTRIBUTION

•**LeJOS upgrade and Odometry:** LeJOS released a new version that promised several bug fixes, new features and tools, for example one tool helps with external logging of the brick. The upgrade was done with David. The odometry manages to navigate back after several simple movements, it could be used as a fallback if we lost the bluetooth connection during the match.

•**Score a goal:** The Strategy had a very complex code, including all necessary functions for generating paths with obstacle avoidance, but it did not work for both unofficial and official friendly matches. I developed a simplified code in a separate branch for the third milestone, so we have something that works and could serve as a building block after the Strategy code is revisited and fixed.

•**Profiler:** There were debates whether the Strategy should run on a separate computer node, plus the application tended to get slower after several minutes of running. As Michal recommended us, I ran a profiler on top of our application: one session was 5 minutes without initialising the Vision, the other was 5 minutes with the initialised Vision and some constant workload (sending commands to the robot with a random movement on the pitch). The summary results and graphs are a part of this report, I have also published the raw data on our repository for the future reference. The application seems OK in terms of CPU, but there is a potential memory leak that should be further investigated.

Vision	CPU (%)	Memory – Heap (MB)
Initialised	47.6 ± 8.4 (max 80)	50.0 ± 41.4 (max 348.6)
Uninitialised	30.4 ± 5.1 (max 53)	71.8 ± 9.9 (max 109.5)

TABLE I
AVERAGE RESULTS FROM RUNNING THE PROFILER FOR 5 MIN.

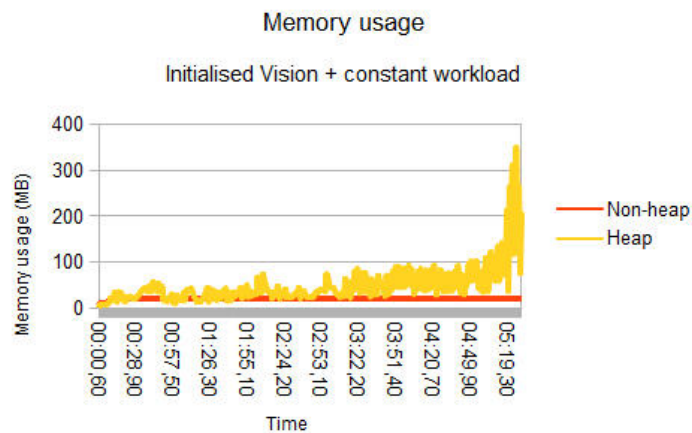
III. AREAS THAT NEED IMPROVEMENT

•**Odometry:** It fails with more complex movements.

•**Strategy code:** It did not work during the first friendly matches.

IV. POINTS

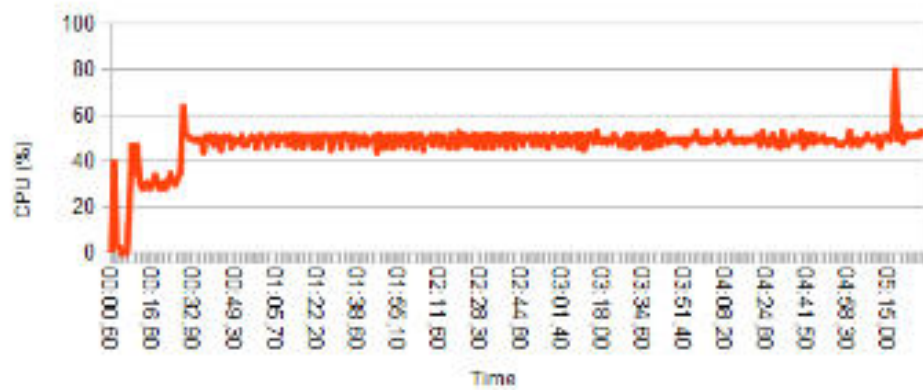
I believe I earned either 9 or 6 for this performance review. I suggest Darie to be awarded for exceptional work, because he developed methods for smoothing the path, getting navigation points and predicting positions in the Strategy code. Some of them were essential for this milestone and the others will be useful for the next milestone and in the matches.



APPENDIX

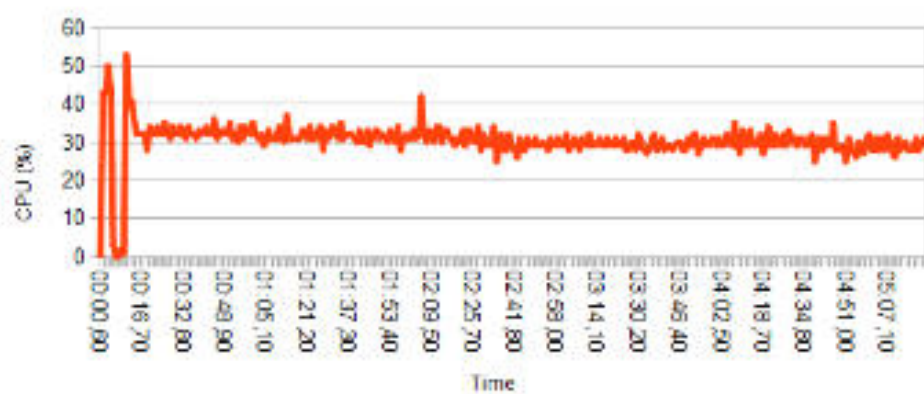
CPU load

Initialised Vision + constant workload



CPU load

Uninitialised Vision



Memory usage

Uninitialised Vision

