

# Expanding the proof rule base of AtelierB automated prover - Research Proposal

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**Abstract**—AtelierB is a tool for formal software development through refinement, using the B-method. It incorporates an automated prover, which has been recognized as the most thorough prover for B set theory, and has been used as a basis for many others. Nevertheless it has multiple shortcomings. Various approaches have been suggested and taken to improve its performance, including extensions to the proof rule base, created by the users. In this work we aim to create such an extension, ensuring that all added rules are sound and well-reasoned. We also aim to identify any limitations of this approach. The secondary goal is to improve the robustness of the software without straying from pure B method, and taking into account the ease of use. As a metric of our success, we use the benchmarks proposed by Conchon and Iguernala [1].

**Index Terms**—B method, formal verification

## I. INTRODUCTION

## II. RELATED WORKS

## III. PROJECT AIMS

### A. Choice of Scenarios

### B. Metrics

### C. Expected learning outcomes

### D. Appropriateness of Research Methods

## IV. PROJECT MANAGEMENT

### A. Methodology

### B. Timeline

Key dates, as listed by the CS907 Dissertation Project website, are:

- **19<sup>th</sup> January:** Registration of dissertation topics
- **16<sup>th</sup> February:** Submission of project proposals
- **24-28<sup>th</sup> April:** Project presentations
- **6<sup>th</sup> July:** Submission of interim reports
- **14<sup>th</sup> September:** Submission of dissertation

It is also important to take into account dates of terms, which are 9<sup>th</sup> January to 18<sup>th</sup> March for the Spring Term, and 24<sup>th</sup> April to 1<sup>st</sup> July for the Summer term, with the exams commencing on or after the 15<sup>th</sup> May, and being spread over a period of about two weeks.

### C. Progress

### D. Constraints and Risks

#### 1) Copyrights for AtelierB software:

2) *Risk of data loss or machine failure:* A GitHub repository has been set up to contain a remote back up of the work done so far. It has the additional benefits of allowing work from multiple machines, and convenient tracking of changes. The address of the repository is: <https://github.com/agata-borkowska/dissertation> .

## V. CONCLUDING REMARKS

## REFERENCES

- [1] S. Conchon and M. Iguernala, "Increasing Proofs Automation Rate of Atelier-B Thanks to Alt-Ergo" in *Proc. 1st Int. Conf. Reliability, Safety and Security of Railway Systems (RSSRail 2016)*, Springer, 2016, pp. 243-253