# Research Project Application Form

*Graduate School of Natural Sciences*

Use of this form is mandatory for all large research projects, notably final thesis work ("afstuderen"). It must be handed in by the student at the student desk ("studentenbalie"), Buys Ballot Building room 184b, prior to starting the project.

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| **Student** | |
| **Name of MSc programme** | Computing Science |
| **First and last name of student** | Ernesto Rodriguez |
| **Email address** | e.rodriguez@students.uu.nl |
| **Student number** | 4083369 |
| **Project supervisor (first examiner)** | |
| **Name and title (must be a Utrecht University staff member)** | Dr. Wouter Sweistra |
| **Faculty, department and Research group (chair)** | Faculty of Science, Department of Information and Computing Science, Software Technology Group |
| **Email address** | W.S.Swierstra@uu.nl |
| **Daily supervisor**<br>**Fill out this section only if the project supervisor is not the daily supervisor!** | |
| **Name and title** | |
| **Affiliation** | |
| **Address** | |
| **Telephone number** | |
| **Email address** | |
| **Second examiner** | |
| **Name and title (must be a Utrecht University staff member)** | Prof. dr. J.T. Jeuring |
| **Faculty and Research group (chair)** | Faculty of Science, Department of Information and Computing Science, Software Technology Group |
| **Email address** | **j.t.jeuring@uu.nl** |

| Research project | |
|---|---|
| **Title** | Generic Programming in F# |
| **Location** | Software Technology Group |
| **Starting date** | December 10th, 2014 |
| **Ending date** | August 30th, 2015 |
| **Number of ECTS** | 40 |
| **Short description of the project, including aims** | There exists several approaches for Generic Programming in the Haskell Programming Language. Many of them have been developed here at Utrecht University. The current approaches are highly dependent on advanced features of the Haskell language and are difficult to implement in other languages.<br><br>This research project aims to study how to extend these approaches to the F# programming language. F# is also a functional language like Haskell but designed with simplicity in mind for easier and wider adoption in industry. Due to the lack of features in F#, the existing methods for generic programming are not directly usable in the F# language.<br><br>The objective of this research is research how can Generic Programming be done in F# and develop a Generic Programming library for F# taking as inspiration what already exists for Haskell. Concretely speaking the objectives are:<br><br>• Investigate how well can the technologies used in Haskell for Generic Programming be supported in F#.<br><br>• Implement a library for Generic Programming in F#.<br><br>• Evaluate the library by comparing it to existing libraries.<br><br>• Build tools to support/ease the use of the library.<br><br>At the end of the research, the library should be practical enough for daily use. It is still an open question to determine what aspects of Generic Programming can be practically supported in F#. |

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| Agreements between student and supervisors | |
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| **Number of hours available for supervision** | **40** |
| **Planning/timing of the supervision (e.g. 'weekly meetings')** | **1 hour weekly meetings** |
| **Agreed student work load (e.g. full time, 4 days/week, etc.)** | **Full time** |
| **Student absence (holidays, courses, etc.)** | 3rd Block, student intends to enroll to the Program Verification Course. From 18th of December till 12th of January, the student will be abroad. |
| **Supervisor absence (holidays, conferences, etc.)** | |
| **Intermediate evaluations of student performance (specify at least two dates)** | **27th of February, 2015 and 22nd of May, 2015** |
| **Presentations to be held** | **Thesis defense** |
| **Lab/group meetings to be attended** | **Computer Science colloquium and Reading club** |
| **Other activities agreed upon** | |

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| **Primary assessment criteria**<br>**(please see appendix for examples. Final presentation and written thesis must be part of the assessment)** | **Presentation, Thesis and code delivered** |
| **Copyright** | |
| **By signing this document, the student declares to transfer the copyright of any and all products, including the tangible and intellectual products, of the research project to Utrecht University. The rights of the student by scientific standards to be a co-author of publications or to be otherwise acknowledged are still recognized.**<br>**The student is allowed and must upload his final assessed thesis to the university publication archive IGITUR. At a later stage, the thesis may be made public via IGITUR, or its access may be restricted temporarily or indefinitely.** | |
| **Signatures** | |
| **Student signature and date**<br>**(Must be signed when form is handed in at the student desk.)** | |
| **Project supervisor signature and date**<br>**(Must be signed when form is handed in at the student desk.)** | |
| **Master's programme coordinator name, signature, and date**<br>**(Must be signed when form is handed in at the student desk.)** | |
| **Examination board member name, signature and date**<br>**(Approval and signature will be obtained by student desk.)** | |

## Appendix: an incomplete list of possible assessment criteria

- Level – Theoretical level, practical/experimental level, understanding of the underlying matter, amount of work in relation to number of ECTS
- Problem handling – Methods, techniques, design instrumentation, implementation, experiments
- Skills – Analytical skills, model building, distinguishing matters of major and minor importance, evaluation, independence, collaboration, self-reflectiveness, planning
- Effort and attitude
- Originality
- Relevance, valorization
- Report/Thesis – literature survey, problem statement, style of writing, quality of Dutch/English, report structure, textual structure, coherence/consistency, conclusions/recommendations, neatness

- Oral presentation – presentation/public speaking skills, structure, discussion skills, presentational aids