

## Response Summary:

### Section 1. Research projects involving human participants

**P1. Does your project involve human participants?** This includes for example use of observation, (online) surveys, interviews, tests, focus groups, and workshops where human participants provide information or data to inform the research. If you are only using existing data sets or publicly available data (e.g. from Twitter, Reddit) without directly recruiting participants, please answer no.

- No

### Section 2. Data protection, handling, and storage

The General Data Protection Regulation imposes several obligations for the use of **personal data** (defined as any information relating to an identified or identifiable living person) or including the use of personal data in research.

**D1. Are you gathering or using personal data (defined as any information relating to an identified or identifiable living person )?**

- No

### Section 3. Research that may cause harm

Research may cause harm to participants, researchers, the university, or society. This includes when technology has dual-use, and you investigate an innocent use, but your results could be used by others in a harmful way. If you are unsure regarding possible harm to the university or society, please discuss your concerns with the Research Support Office.

**H1. Does your project give rise to a realistic risk to the national security of any country?**

- No

**H2. Does your project give rise to a realistic risk of aiding human rights abuses in any country?**

- No

**H3. Does your project (and its data) give rise to a realistic risk of damaging the University's reputation? (E.g., bad press coverage, public protest.)**

- No

**H4. Does your project (and in particular its data) give rise to an increased risk of attack (cyber- or otherwise) against the University? (E.g., from pressure groups.)**

- No

**H5. Is the data likely to contain material that is indecent, offensive, defamatory, threatening, discriminatory, or extremist?**

- No

**H6. Does your project give rise to a realistic risk of harm to the researchers?**

- No

**H7. Is there a realistic risk of any participant experiencing physical or psychological harm or discomfort?**

- No

**H8. Is there a realistic risk of any participant experiencing a detriment to their interests as a result of participation?**

- No

**H9. Is there a realistic risk of other types of negative externalities?**

- No

## **Section 4. Conflicts of interest**

**C1. Is there any potential conflict of interest (e.g. between research funder and researchers or participants and researchers) that may potentially affect the research outcome or the dissemination of research findings?**

- No

**C2. Is there a direct hierarchical relationship between researchers and participants?**

- No

## **Section 5. Your information.**

This last section collects data about you and your project so that we can register that you completed the Ethics and Privacy Quick Scan, sent you (and your supervisor/course coordinator) a summary of what you filled out, and follow up where a fuller ethics review and/or privacy assessment is needed. For details of our legal basis for using personal data and the rights you have over your data please see the [University's privacy information](#). Please see the guidance on the [ICS Ethics and Privacy website](#) on what happens on submission.

**Z0. Which is your main department?**

- Information and Computing Science

**Z1. Your full name:**

Matthias Heinrich Heinzel

**Z2. Your email address:**

[REDACTED]

**Z3. In what context will you conduct this research?**

- As a student for my master thesis, supervised by::  
Wouter Swierstra

**Z5. Master programme for which you are doing the thesis**

- Computing Science

**Z6. Email of the course coordinator or supervisor (so that we can inform them that you filled this out and provide them with a summary):**

[REDACTED]

**Z7. Email of the moderator (as provided by the coordinator of your thesis project):**

coordinator.cosc@uu.nl

**Z8. Title of the research project/study for which you filled out this Quick Scan:**

Analysis and Transformation of Intrinsically Typed Syntax

**Z9. Summary of what you intend to investigate and how you will investigate this (200 words max):**

When writing a compiler, intrinsically typed syntax trees allow to statically guarantee type- and scope-safety invariants. While this technique is relatively well-known, there has not been much focus on performing program analysis and transformations in this settings. To explore this area, I aim to:

- collect and document common program analyses and transformations for simple expression languages with binders
- develop an understanding of potentially relevant literature, e.g. datatype-generic programming on syntax trees
- implement several transformations on intrinsically typed expressions in the dependently-typed programming language Agda
- attempt machine-checked proofs of their correctness (preservation of semantics)
- explore the common patterns between the transformations and try capturing them as re-usable building blocks

**Z10. In case you encountered warnings in the survey, does supervisor already have ethical approval for a research line that fully covers your project?**

- Not applicable

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## Scoring

- Privacy: 0
  - Ethics: 0
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