Research Objectives and Research Questions

- RO 1: Improve IDE and LSP Generation
  - RQ 1.1: How can IDE generation be improved to support LSP and DAP?
  - RQ 1.2: What are the key challenges in generating LSP and DAP for different programming languages?
  - RQ 1.3: How can a universal LSP and DAP be developed to support multiple languages and IDEs?
- RO 2: Facilitate LSP and DAP Modularization
  - RQ 2.1: How can LSP and DAP modularization be facilitated in language workbenches?
  - RQ 2.2: What are the key challenges in modularizing LSP and DAP for different programming languages?
  - RQ 2.3: How can LSP and DAP modularization be integrated with existing language composition and modularization features in language workbenches?
- RO 3: Reduce to L x 1 the number of combinations to support L languages
  - RQ 3.1: How can the number of combinations required to support multiple languages be reduced to L × 1?
  - RQ 3.2: In what ways does simplifying the development process for language support enhance efficiency?
  - RQ 3.3: How does reducing combinations impact the speed and effectiveness of creating language support?
- RO 4: Leverage Neverlang for LSP and DAP in LPL Development
  - RQ 4.1: How can Neverlang's LPL development features be leveraged for creating a reusable core for LSP and DAP functionalities?
  - RQ 4.2: What are the key benefits of using Neverlang for LSP and DAP development in the context of LPLs?
  - RQ 4.3: How does leveraging Neverlang's LPL features enhance the scalability and efficiency of LSP and DAP development?

Language Workbenches

- JustAdd -> Computer Science department of the Lund University (Lund, Sweden)
- Melange -> DiverSE research team at the Institut National de Recherche en Informatique et en Automatique(INRIA) (Paris, France)
- MontiCore -> Software Engineering group at the RWTH Aachen University (Aachen (Aquisgrana), Germany)
- MPS -> JetBrains Research (Saint Petersburg, Russia)
- Rascal -> Centrum Wiskunde & Informatica (CWI) (Amsterdam, Netherlands)
- Spoofax -> Delft University of Technology (Delft, Netherlands)
- Xtext -> Eclipse Foundation (Ottawa, Canada)
- Neverlang -> Università degli Studi di Milano (Milan, Italy)

Jurnals and Conferences

- ACM (Association for Computing Machinery) -> New York, USA, 1947. It is the world's largest scientific and educational computing non-profit association.

Journals

- JSS (Journal of Systems and Software)
- TSE (IEEE Transactions on Software Engineering)
- TOSEM (ACM Transactions on Software Engineering and Methodology)
- TOPLAS (ACM Transactions on Programming Languages and Systems)

Conferences

- ICSE (International Conference on Software Engineering)
- PLDI (Programming Language Design and Implementation)
- OOPSLA (Object-Oriented Programming, Systems, Languages, and Applications)
- SLE (Software Language Engineering)

Important Figures

- Martin Fowler: Renowned for his work on software development methodologies. His book "Domain-Specific Languages" is a seminal work in the field.
- Markus Voelter: Known for his contributions to the development and promotion of language workbenches like JetBrains MPS.
- Eelco Visser: A professor at Delft University of Technology, Visser has made significant contributions to the field through his work on the Spoofax language workbench.
- Gregor Kiczales: Known for his work on aspect-oriented programming (AOP).
- Antonia Bertolino: Known for her work on software testing and quality assurance.

Questions for PhD Interview

“Why do you want to do a PhD?”

I want to pursue a PhD for several reasons. Firstly, I have a deep passion for [your field of study], and I am eager to contribute to advancing knowledge in this area. Throughout my academic journey, I have been fascinated by [specific aspect of your field], and I believe that a PhD will provide me with the rigorous training and research opportunities necessary to make meaningful contributions.

Secondly, I thrive in collaborative environments. I find that working with others not only enhances my own understanding but also leads to more innovative and impactful research outcomes. While I know that I will be working alone, I am confident that the skills and insights I have gained from previous collaborations will greatly benefit my independent research.

Additionally, I see a PhD as a critical step toward my long-term career goals. I aspire to [specific career aspiration, e.g., “become a professor and conduct independent research], and the skills and knowledge I will gain from this program are essential for achieving these objectives. I am committed to continuous learning and professional growth, and I believe that a PhD will equip me with the expertise and experience necessary to excel in my future career.

“Why did you choose this specific field of study?”

I chose this field because of my deep interest in [specific aspect or topic]. During my undergraduate/graduate studies at [previous institution], I was particularly drawn to [related course or project], which sparked my passion for [field]. My experiences with [specific projects or research] further solidified my decision.

“How does your previous work prepare you for this PhD program?”

My previous work has equipped me with the necessary skills and knowledge for this PhD program. For instance, my experience with [specific project or job] taught me [relevant skills], and my involvement in [another relevant experience] helped me develop [another relevant competency]. Additionally, my publications and collaborations in [specific area] have prepared me to contribute meaningfully to this program.

“What are your career aspirations after completing your PhD?”

After completing my PhD, I aspire to pursue a career in [academic/industry/non-profit research]. I am particularly interested in [specific role or sector], where I can [desired impact or contribution]. My long-term goal is to [broader career objective], which aligns with the skills and knowledge I will gain during this PhD program.

“How do you see your research evolving in the next few years?”

In the next few years, I envision my research evolving to address [related emerging questions or new directions]. I aim to expand my work by [mention potential collaborations, new techniques, or additional funding]. This will allow me to explore [new aspects or applications] of my current research and contribute more comprehensively to the field.

“Why did you choose our university and this PhD program?”

I chose your university and this PhD program because of its strong reputation in [specific field], as well as the opportunity to work with esteemed faculty members like [specific professor]. The resources and facilities available, such as [specific labs or centers], are particularly appealing. Additionally, the university’s commitment to [specific value or initiative] aligns with my own academic and professional goals.

“How do you plan to contribute to our academic community?”

I plan to contribute to your academic community by actively participating in [seminars, workshops, or conferences]. I am also eager to collaborate with fellow researchers and contribute to ongoing projects within the department. Furthermore, I hope to engage with students through teaching or mentoring, sharing my expertise and fostering a collaborative learning environment.

Additional Resources

Journals

- CACM (Communications of the ACM)
- SCP (Science of Computer Programming)
- STTT (Software and Systems Modeling)
- JOT (Journal of Object Technology)
- JFP (Journal of Functional Programming)
- SCP (Science of Computer Programming)

Conferences

- SPLC (Software Product Line Conference)
- ICPC (International Conference on Program Comprehension)
- SPLASH (Systems, Programming, Languages, and Applications: Software for Humanity)
- POPL (Principles of Programming Languages)
- MODELS (Model Driven Engineering Languages and Systems)
- ECOOP (European Conference on Object-Oriented Programming)
- ESEC/FSE (Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering)
- ASE (Automated Software Engineering)
- ICFP (International Conference on Functional Programming)
- ESOP (European Symposium on Programming)
- VMCAI (Verification, Model Checking, and Abstract Interpretation)
- GPCE (Generative Programming and Component Engineering)