Metacomputations Group

PL&T lab

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About

About me

- Group leader — Daniil Berezun
- PhD [2018] “Traversal-based normalization”
- Docent (associate professor), SPbU

Areas of Interest

- **Metacomputations** and applications
  - Joint project with Semyon Grigorev (Syntactic guided data analysis group)
  - Assisting Dmitri Boulytchev’s group (Relational Programming Group)
- Compilers, types, languages, ...
  - Language semantics and transformations
  - Semantics-directed program and compiler generation
- String Algorithms (semi-local lcs and sa)
- ...

The Group and Projects

Project/Area	Student	Affiliation	Tasks/Tools
High-level languages for high-performance computing[1]	Turin A.[2]	SPbU, Mas.st.	FHW
	Vinnik E.	SPbU, Bach.st.	Implementing distiller (on Haskell)
	Nikolyukin M.	HSE, Bach.st.	Reduceron
String algorithms (semi-local lcs and sa)	Mishin N.[2]	SPbU, Mas.st.	Developing C++emiAlgo library
	Boitsov E.	SPbU, Bach.st.	Adopting to oneAPI (DPC++)
Program execution visualizer on miniKanren	Buhner M.	NGU, Bach.st.	Ocaml & miniKanren
Code Metrics for OCaml	Tochilina E.	SPbU, Bach.st	Ocaml
Semantics-directed compier generation	Erin I.	SPbU, Bach.st.	GraalVM
Vyper plugin	Kasimov V.	SPbU, Bach.st.	on IntelliJ Platform
	Loctev S.	SPbU, Bach.st.	

[1]Joint with Semion Grigorev (Syntactic guided data analysis group)
[2]Supported with grant

Publications

- ICPP'21 [Scopus, A], *Efficient Parallel Algorithms for String Comparison*
  N. Mishin, D. Berezun, A. Tiskin
- VPT'21 [Scopus], *An Empirical Study of Partial Deduction for miniKanren*
  E.Verbitskaia, D.Berezun, D.Boulytchev
- TFPIE'21 [Scopus] [proceedings are not published yet], *Reimplementing the Wheel: Teaching Compilers with a Small Self-Contained One*, D. Boulytchev, D. Berezun
- SEIM'21 [Scopus], *Viterbi algorithm specialization using linear algebra*,
  I. Tyulyandin, D. Berezun, S. Grigorev
- SYRCoSE'21, *Empirical Study of Partial Evaluation of Matrix and String Algorithms*,
  I.Balashov, S.Grigorev, D.Berezun
- ICFP'21 SRC poster, *Distilled Sparce Linear Algebra* A.Turin
- miniKanren 2020, *An Empirical Study of Partial Deduction for miniKanren*,
  E. Verbitskaia, D.Berezun, D.Boulytchev
- TEASE-LP'20, Binding-Time Analysis for miniKanren, E. Verbitskaia, I. Artemeva, D.Berezun
- PPoPP'20 [Scopus, A], Optimizing GPU programs by partial evaluation,
  A.Tyurin, D.Berezun, S.Grigorev
- SYRCoSE'19, Overview of the Languages for Safe Smart Contract Programming,
  A.Tyurin, I.Tyulyandin, V.Maltsev, I.Kirilenko, and D. Berezun
- SEIM'19, Survey on Blockchain Technology, Consensus Algorithms, and Alternative Distributed Technologies N.Mishin, A.Fefelov, V.Bushev, I.Kirilenko, and D.Berezun
- PEPM'17 [Scopus, B], Compiling untyped lambda calculus to lower-level code by game semantics and partial evaluation, D.Berezun and Neil D. Jones
- ...

Teaching

Annual

- Introduction into Metacomputations (6 times) [HSE, ITMO]
- Introduction into Compilers (12 times; with Dmitri Boulytchev) [ITMO, HSE, LETI, CSC]

Single

- Discrete Mathematics (practices) [SPbU 2021–2022]
- Mathematical Logic for Programmers [SPbU 2021]
- Linux basics [SPbU 2020]
- Operating Systems [SPbU 2021]
- Programming basics [SPbU 2020]
- Introduction into OOP [SPbU 2020]
- Principles of organization and architecture of computer systems (practices) [SPbU 2020]