Logic and Reasoning Group

COST Action IC0901

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Serbia

COST Action IC0901
Kick-off meeting
Brussels, October 30, 2009

Group members

- Silvia Ghilezan, Professor,
- Jovanka Pantović, Associate Professor
- Jelena Ivetić, PhD student
- Svetlana Jaksić, PhD student
- Petar Maksimović PhD student

Group members abroad (Switzerland, France, Italy)

- Viktor Kunčak, PhD MIT, EPFL Laussane
- Silvia Likavec, PhD, U. of Torino, ENS-Lyon
- Dragiša Žunić, PhD, ENS-Lyon

Some ongoing collaboration

- Henk P. Barendregt, The Netherlands
- Mariangiola Dezani-Ciancaglini, Italy
- Daniel Dougherty, WPI, USA
- Hugo Herbelin, INRIA, France
- Furio Honsell, U. Udine, Italy
- Marina Lenisa, U. Udine, Italy
- Pierre Lescanne, ENS-Lyon, France
- Luigi Liquori, INRIA, France
- Salvador Lucas, UPV, Spain

Program extraction

Computational interpretation of logic

- formulae – as – types
- proofs – as – terms
- proofs – as – programs

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- Hilbert's axiomatic system $\leftrightsquigarrow$ combinators;
- Natural Deduction $\leftrightsquigarrow$ λ-calculus;
- Sequent calculus $\leftrightsquigarrow$???

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- Sequent calculus $\leftrightsquigarrow$??? (several term calculi)

Proofs in sequent calculi are much smaller than proofs in the more widely used natural deduction based or axiomatic based logical systems.

Program extraction in classical logic

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- Axiomatic system $\leftrightsquigarrow$ formulae-as-types notion of control;
- Natural Deduction $\leftrightsquigarrow$ algorithmic interpretation of classical logic CBN and CBV;
- Sequent calculus $\leftrightsquigarrow$???

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Nondeterminism

Undecidability

Moving proofs-as-programs into practice

- Methods for extracting programs from formal proofs in these more efficient sequent proof systems.
- Methods for efficiently extracting programs from proofs in certain classes of logical system.
- The goal is to extract readable and efficient programs from these proofs.
- Development of tools suitable for finding proofs and witnesses of property violation.

Recent and future events

- DEUKS Tempus project no. 41099
  Development of a doctoral school in IT.
  2007-2009
  http://cms.uns.ac.rs/deuks

- FIT 2009 - Foundation of Information Technology Summer School
  June 14-27, 2009
  http://cms.uns.ac.rs/fit2009

RDP 2011 – Novi Sad, Serbia, June 2010

RDP 2011 - Federate Conference on Rewriting, Deduction, and Programming

- TLCA 2011 - Typed Lambda Calculus and Application (Luke Ong)
- RTA 2011 - Rewriting Techniques ad Application (Manfred Schmidt-Schauss)
- Affiliated workshops
- COST Project meeting in 2011?