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LAST CALL FOR EXTENDED ABSTRACTS

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THedu'11  
CTP components for educational software  
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(CTP -- Computer Theorem Proving)  
<http://www.uc.pt/en/congressos/thedu>

Workshop at CADE-23,  
23rd International Conference on Automated Deduction  
Wroclaw, Poland, July 31- August 5, 2011  
<http://cade23.ii.uni.wroc.pl/>

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Important Dates

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- \* Extended Abstracts/Demo proposals 29 Apr 2011 (PDF, easychair [2])
- \* Author Notification: 3 Jun 2011
- \* Workshop Day: 31 Jul 2011
- \* Full papers (post-proceedings): 27 Aug 2011 (LaTeX, easychair[2])

THedu'11 Scope

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This workshop intends to gather the research communities for Computer Theorem proving (CTP), Automated Theorem Proving (ATP), Interactive Theorem Proving (ITP) as well as for Computer Algebra Systems (CAS) and Dynamic Geometry Systems (DGS).

The goal of this union is to combine and focus systems of these areas and to enhance existing educational software as well as studying the design of the next generation of mechanised mathematics assistants (MMA). Elements for next-generation MMA's include:

\* Declarative Languages for Problem Solution: education in applied sciences and in engineering is mainly concerned with problems, which are understood as operations on elementary objects to be transformed to an object representing a problem solution. Preconditions and postconditions of these operations can be used to describe the possible steps in the problem space; thus, ATP-systems can be used to check if an operation sequence given by the user does actually present a problem solution. Such "Problem Solution Languages" encompass declarative proof languages like Isabelle/Isar or Coq's Mathematical Proof Language, but also more specialized forms such as, for example, geometric problem solution languages that express a proof argument in Euclidean Geometry or languages for graph theory.

\* Consistent Mathematical Content Representation: libraries of existing ITP-Systems, in particular those following the LCF-prover

paradigm, usually provide logically coherent and human readable knowledge. In the leading provers, mathematical knowledge is covered to an extent beyond most courses in applied sciences. However, the potential of this mechanised knowledge for education is clearly not yet recognised adequately: renewed pedagogy calls for enquiry-based learning from concrete to abstract --- and the knowledge's logical coherence supports such learning: for instance, the formula  $2\pi$  depends on the definition of reals and of multiplication; close to these definitions are the laws like commutativity etc. Clearly, the complexity of the knowledge's traceable interrelations poses a challenge to usability design.

\* User-Guidance in Stepwise Problem Solving: Such guidance is indispensable for independent learning, but costly to implement so far, because so many special cases need to be coded by hand. However, CTP technology makes automated generation of user-guidance reachable: declarative languages as mentioned above, novel programming languages combining computation and deduction, methods for automated construction with ruler and compass from specifications, etc --- all these methods 'know how to solve a problem'; so, using the methods' knowledge to generate user-guidance mechanically is an appealing challenge for ATP and ITP, and probably for compiler construction!

In principle, mathematical software can be conceived as models of mathematics: The challenge addressed by this workshop is to provide appealing models for MMAs which are interactive and which explain themselves such that interested students can independently learn by inquiry and experimentation.

#### Program Chairs

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Ralph-Johan Back, Abo University, Turku, Finland  
Pedro Quaresma, University of Coimbra, Portugal

#### Program Committee

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#### Submission

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THedu'11 seeks papers and demos presenting original unpublished work which is not been submitted for publication elsewhere.

Both, papers and demos, are submitted as extended abstracts first (29 Apr 2011), which must not exceed five pages. The abstract should be new material. Demos should be accompanied by links to demos/downloads and [existing] system descriptions. Availability of such accompanying material will be a strong prerequisite for acceptance.

The authors of the extended abstracts and system descriptions should submit to easychair [2] in PDF format generated by EPTCS LaTeX style [3]. Selected extended abstracts and system descriptions will appear in CISUC Technical Report series (ISSN 0874-338X, [1]).

At least one author of each accepted paper/demo is expected to attend THedu'11 and to present her or his paper/demo, and the extended abstracts will be made available online.

After presentation at the conference selected authors will be invited to submit a substantially revised version, extended to 10-14 pages, for publication by the Electronic Proceedings in Theoretical Computer Science (EPTCS). Papers/system descriptions will be reviewed by blind peer review and evaluated by three referees with respect to relevance, clarity, quality, originality, and impact.

Revised versions are submitted in LaTeX according to the EPTCS style guidelines [3] via easychair [2].

[1] <http://www.uc.pt/en/fctuc/ID/cisuc/RecentPublications/Techreports/>

[2] <http://www.easychair.org/conferences/?conf=thedu11>

[3] <http://www.cse.unsw.edu.au/%7Ervrg/EPTCS/eptcsstyle.zip>