

## Working Group

### *eduTPS: JUSTIFYING MATH -- Working Group on Education and TP Technology*

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*Mathematics is not only calculating, numeric and symbolic calculation, not only explaining with figures --- the distinguishing feature of math is justifying and deducing properties of mathematical objects and operations on firm grounds of logics.*

*So Computer Algebra Systems (CAS) model calculation, Dynamic Geometry Systems (DGS) model figures --- and (Computer) Theorem Provers (TPS) model deduction and reasoning, mechanised by formal logic.*

*TPS are widely unknown despite the fact, that recent advances in mathematics could not have been done without them (e.g. mechanised proofs of the Four Colour Theorem, of the Kepler Conjecture, etc.), that TPS are becoming indispensable in verification of requirements on complex technical systems (e.g. google car) and despite the fact, that leading TPS have math mechanised from first principles (axioms) to all undergraduate math and beyond.*

*So the working group "eduTPS: justifying math" addresses a wide range of topics, from educational concepts of reasoning, explaining and justifying and from respective classroom experience on the one side to technical concepts and software tools, which mechanise and support these mathematical activities, on the other side.*

*We elicit contributions from educators to the educational side as well as TP experts to the technical side --- the working group shall interactively elaborate on the connections between the two sides, connections which are not yet clarified to a considerable extent. Narrowing the apparent gap between TP technology and educational practice (and theory!) concerns the distinguishing*

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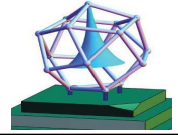
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**Sixth Central- and Eastern European Conference on  
Computer Algebra- and Dynamic Geometry Systems  
in Mathematics Education  
7-10 September, 2016 Targu Mures, Romania**



*essence of mathematics and may well lead to considerable innovations in how we teach and learn mathematics in the future.*

*Points of interest include:*

- \* Adaption of TP*
- \* Requirements on software support for reasoning*
- \* Automated TP in geometry*
- \* TP components in SW for engineers*
- \* Levels of authoring*
- \* Adaptive dialogues, students modeling and learning paths*
- \* Next-step-guidance*
- \* TP as unifying foundation*
- \* Continuous tool chains*

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