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# 7th CADGME

## Conference on Digital Tools in Mathematics Education



Monday, 25.06.2018

**Registry (1st floor)**

16h-18h

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Tuesday, 26.06.2018

**Registry (1st floor)**

8h30

**Opening Ceremony**

(Room Pedro Nunes)

9h-9h30

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## **Keynote Speaker: Katarzyna Winkowska-Novak**

(Room Pedro Nunes)

9h30-10h30

## **Coffee Break**

(2nd floor)

10h30-11h

## **Workshops: WS1 + WS4**

(Room Lab. 0.2 + Room 2.3)

11h-12h30

## **Parallel Sessions: PS1 + PS3**

(Room 2.4 + Room 2.5)

11h-12h30

## **Lunch**

(Inst. Justiça e Paz)

12h30-14h

## **Working Group: WG1 + WG7**

(Room 17 Abril + Room 2.3)

14h-15h30

## **Workshops: WS2**

(Room Lab. 0.2)

14h-15h30

## **Parallel Sessions: PS1 + PS3**

(Room 2.4 + Room 2.5)

14h-15h30

## **Coffee Break**

(2nd floor)

15h30-16h



**Working Group: WG3**  
(Room 2.3)

16h-17h30

**Workshops: WS9**  
(Room Lab. 0.2)

16h-17h30

**Parallel Sessions: PS1 + PS3**

(Room 2.4 + Room 2.5)

16h-18h00

**Welcome Reception (Porto wine tasting)**  
(2nd floor)

18h00-19h00

Wednesday, 27.06.2018

**Working Groups: WG1**  
(Room 17 Abril)

8h30-11h

**Working Groups: WG2**  
(Room 2.3)

8h30 - 10h30

**Working Groups: WG3 + WG4**  
(Room 2.4 + Room 2.5)

9h-11h

**Coffee Break**  
(2nd floor)

11h-11h30

**Keynote Speaker: Ornella Robutti**  
(Room Pedro Nunes)

11h30-12h30



## Lunch

(Inst. Justiça e Paz)

12h30-13h45

## Keynote Speaker: Kristof Fenyvesi

(Science Museum)

13h45-14h45

## Keynote Speaker: TAME - Pedro Freitas

(Science Museum)

14h45-15h15

## Keynote Speaker: TAME - Robert Fathauer

(Science Museum)

15h15-15h45

## Coffee Break

(Science Museum - grab&go)

15h45-16h

## Social Programme

16h-19h

Invited Talk ; Visit to the Science Museum; Visit to the University; Walk Downtown

## Gala Dinner

20h-23h30

Galla Dinner at "Colo da Graça" and a performance of "Fados de Coimbra"





Thursday, 28.06.2018

**Working Groups: WG2 + WG7**

(Room 17 Abril + Room 2.5)

9h-11h

**Working Group: WG1 + WG5**

(Room 2.3 + Room 2.4)

9h-10h30

**Workshop: WS7**

(Lab. 0.2)

9h-10h30

**Coffee Break**

(2nd floor)

11h-11h30

**Keynote Speaker: Jaime Carvalho e Silva**

(Room Pedro Nunes)

11h30-12h30

**Lunch**

(Inst. Justiça e Paz)

12h30-14h

**Working Groups: WG6****(Room 2.3)**

14h-15h30

**Workshops: WS5****(Lab. 0.2)**

14h-15h30

**Parallel Sessions: PS2****(Room 2.4)**

14h-15h30

**Coffee Break****(2nd floor)**

15h30-16h

**Working Groups: WG4****(Room 2.3)**

16h-17h30

**Workshops: WS3****(Lab. 0.2)**

16h-17h30

**Parallel Sessions: PS2****(Room 2.4)**

16h-17h30





Friday, 29.06.2018

**Working Groups: WG2 + WG4**

(Room 17 Abril + Room 2.3 )

9h-11h

**Working Groups: WG5**

(Room 2.4)

9h-10h30

**Parallel Sessions: PS2**

(Room 2.5)

9h-11h

**Coffee Break**

(2nd floor)

11h-11h30

**Keynote Speaker: Philippe R. Richard**

(Room Pedro Nunes)

11h30-12h30

**Lunch**

(Inst. Justiça e Paz)

12h30-14h

**Excursion (optional)**

14h30-23h

Batalha ; Alcobaça; Nazaré (dinner at Nazaré)

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## Working Groups

**WG1 - 26/06 - (14h) - Chair: Zsolt Lavicza (Room 17 Abril)**

- Daniela Ferrarello, Maria Flavia Mammana and Eugenia Taranto -- Non-Euclidean Geometry with art by means of GeoGebra
- Eleonora Stettner -- Traditional Patterns of Easter Eggs in the Carpathian Basin and Spherical Symmetries (Illustrating Spherical Symmetries in GeoGebra)
- Alvaro Martínez Sevilla -- Hyperbolic Escher GeoGebra

**27/06 - (8h30) - Chair: Carlota Simoes (Room 17 Abril)**

- Zsolt Lavicza, Kristóf Fenyvesi, Philip Collett, Thierry Dana-Picard, Sara Hershkowitz, Werner Olivier, Gyorgy Tury, Gabriella Uhl and Diego Lieban -- STEAM for the Future - Integrating Hungarian, Israeli and South African Arts into Mathematics Teaching
- Daniel Lakos and Eszter Losonczi -- Jump from paper
- Penousal Machado and Tiago Martins -- Evolved Artificial Ants Paintings on Instagram
- Alvaro Martínez Sevilla -- Book Presentation: around the "Paseos Matemáticos por Granada"
- Tomas Recio -- Exploring artwork through Voronoi/Delaunay diagrams

**28/06 - (9h) - Chair: Vanda Santos (Room 2.3)**

- Alla Stolyarevska -- DeepDream reveals the connection between art and mathematics
- Valentyna Pikalova, Oksana Hrytsenko and Iryna Rusina -- Exploring Ukrainian Embroidery with GeoGebra and Python
- Diego Lieban and Zsolt Lavicza -- Moving to Spatial Thinking through Geometric Modeling: an approach among prospective teachers combining Physical and Digital Resources

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**WG2 - 27/06 - (8h30) - Chair: Yoichi Maeda (Room 2.3)**

- Satoshi Yamashita and Setsuo Takato -- Active Learning Class Using PDF-Based Video Materials Generated Using KeTCindy
- Naoki Hamaguchi and Setsuo Takato -- Effective combinations of several types of teaching materials
- Tomoya Tokairin -- A new 3D drawing plugin for Cinderella
- Ulrich Kortenkamp and Lena Florian -- Big Data and Next Generation Visualization in the Classroom

**28/06 - (9h) - Chair: Masetaka Kaneko (Room 17 Abril)**

- Koji Nishiura -- Analysis of the Usefulness of Teaching Materials Including Sound Created by KeTCindy
- Shunji Ouchi -- An introduction to teaching materials to guide sample size decisions when using the Central Limit Theorem
- Takeo Noda and Setsuo Takato -- Teaching materials for vector calculus and elementary differential geometry course using KeTCindy
- Christian Mercat -- Teaching complex analysis with a conformal webcam

**29/06 - (9h) - Chair: Ulrich Kortenkamp (Room 17 Abril)**

- Masataka Kaneko and Takeo Noda -- Students' operating CindyJS materials and detecting their reasoning
- Yoichi Maeda -- Simple construction of Hopf fibration with Cabri 3D and visualization of multiplication of unit quaternions
- Hideyo Makishita -- Visualize mathematics by mathematical structures and figures
- Aaron Montag and Jürgen Richter-Gebert -- GPU Accelerated Visualizations in Education

**WG3 - 26/06 - (16h) - Chair: Walther Neuper (Room 2.3)**

- Daniel McDonald -- Automated Drawings, Conjectures, and Proofs in Planar Geometry Using The Wolfram Language
- Tomas Recio, Philippe R. Richard and M. Pilar Velez -- Designing tasks supported by GeoGebra Automated Reasoning Tools for the development of mathematical skills
- Vanda Santos, Nuno Baeta and Pedro Quaresma -- Geometrography in GeoGebra



**27/06 - (9h) - Chair: Anatoli Kouropatov (Room 2.4)**

- Rein Prank -- Step by step solutions of algebraic tasks and educational facilities of CAS
- Walther Neuper -- Mechanised Justification in "Systems that Explain Themselves" for Mathematics Education
- Thierry Dana-Picard and David Zeitoun - The determination of a suitable mesh for automatic plotting of a 2-variable function
- Daniela Ferrarello, Maria Flavia Mammana and Eugenia Taranto -- DGS in proving 3D-geometry properties

**WG4 - 27/06 - (9h) - Chair: Pedro Quaresma (Room 2.5)**

- Thierry Dana-Picard and Zoltan Kovacs -- Automated study of isoptic curves: a new approach with GeoGebra
- José Manuel Dos Santos -- Spherical Tilings and GeoGebra
- Tomoki Hara and Kazushi Ahara -- On materials which allows pupils to find out mathematical propositions using snapping on GeoGebra
- Mária Kmetová, Renáta Vágová and Tibor Kmet - Investigation and Visual Explanation in Dynamic Geometry Environment

**28/06 - (16h) - Chair: Vanda Santos (Room 2.3)**

- Zoltán Kovács and Zsuzsanna Cole -- Wise use of GeoGebra supported by an evaluation routine
- Jiří Blažek and Pavel Pech -- GeoGebra and one locus in a plane
- Renáta Vágová and Mária Kmetová -- Does the Use of Iconic Planar Representations Affect Learner's Visualisation in Solid Geometry Problem Solving?

**29/06 - (9h) - Chair: Ana Breda (Room 2.3)**

- Lilla Korenova and Jan Guncaga -- Discovery learning mathematics with GeoGebra through mobile devices in lower secondary level
- Marita Barabash -- GeoGebra as a Dynamic Geometry tool in mathematics and in mathematics teaching: a case of geometric constructions
- Pedro Quaresma and Vanda Santos - Learning Paths Editor for the Web Geometry



## Laboratory

-- Jiří Blažek and Pavel Pech -- Synthetic solution in geometry and GeoGebra

### WG5 - 28/06 - (9h) - Chair: Anatoly Kouropatov (Room 2.4)

-- Michal Fraenkel, Anatoli Kouropatov and Regina Ovodenko -- Didactic consideration with respect to applets for the teaching of mathematics

-- Claudia Lazaro and Tomas Recio -- Project MoMaTrE (Mobile Maths Trails in Europe, [www.momatre.eu](http://www.momatre.eu))

-- Giulia Bini and Germana Trincheri -- Changing Plans: How dynamic Merlo items can support students' understanding in 3d Geometry

### 29/06 - (9h) - Chair: Zsolt Lavicza (Room 2.4)

-- Sonia Abrantes Garcez Palha -- Designing a digital tool for reasoning with covariation graphs: didactical considerations and classroom experience

-- José Manuel Diego-Mantecón, Óscar Arcera, Teresa F. Blanco and Zsolt Lavicza -- Building a Robot with Secondary School Students to Solve the Rubik Cube

-- Werner Olivier - An offline techno-blended model for enriching mathematics teaching and learning in South African schools

### WG6 - 28/06 - (14h) - Chair: Jozef Hvorecký (Room 2.3)

-- Cristina Naya -- Activities for the classroom with scientific calculator (Mathematics in Secondary level)

-- Eszter Kónya and Zoltán Kovács -- Do the calculators support inductive reasoning?

-- Lilla Korenova and Jozef Hvorecký -- Learning Descriptive Statistics using CASIO Classwiz Calculators

### WG7 - 26/06 - (16h) (Room 2.3)

-- Antonio Zarauz Moreno, José Luis Rodríguez Blancas and Diego Cangas Moldes -- NeoTrie



**28/06 - (9h) - Chair: Christian Mercat (Room 2.5)**

-- Christian Mercat and Laurent Beddou -- Augmented reality in Pétanque as a teaching tool

-- Alvaro Martínez Sevilla, Carlos Ureña Almagro and Tomás Recio -- Augmented Reality, Maths Walks and GeoGebra

-- Lilla Korenova, Theodosia Prodromou and Zsolt Lavicza -- Augmented reality in mathematics Education: A cross-national study

## Workshops

**WS1 - 26/06 - (11h) -- Ana Cristina Oliveira -- The use of GeCla program for studying plane symmetry (Lab. 0.2)**

**WS2 - 26/06 - (14h) -- Eugenia Taranto, Ferdinando Arzarello, Ornella Robutti, Virginia Alberti and Sara Labasin -- MOOC for mathematics teacher education: a collaborative space for learning (Lab. 0.2)**

**WS3 - 28/06 - (16h) -- Kristóf Fenyvesi, Hogul Park, Diego Lieban and Zsolt Lavicza -- Problem-solving based Combination of Hands-on and Digital Modelling in the Process of Mathematics Learning: 4Dframe & GeoGebra in the Exploration of Simple and Complex Structures and Mechanisms (Lab. 0.2)**

**WS4 - 26/06 - (11h) -- Setsuo Takato, Yasuyuki Kubo and Masataka Kaneko -- Usage and recent developments of KetCindy (Room 2.3)**

**WS5 - 28/06 - (14h) -- Diego Lieban, Zsolt Lavicza, Kristóf Fenyvesi, Hogul Park and Taeyoung Choi -- Who do You Feel Yourself? An Engineer, Mathematician, Programmer, Artist or Physcist?...It doesn't Matter, Just Play (Lab. 0.2)**

**WS7 - 28/06 - (9h) -- Dennis Debay and Karen Terrell -- Stories & Technology: Gateways into Mathematics for All (Lab. 0.2)**



WS9 - 26/06 - (16h) -- Lilla Korenova, Jan Guncaga and Jozef Hvorecky -- Making a Graphic Calculator from a Numerical One (Lab. 0.2)

## Parallel Sessions

PS1 - 26/06 - (11h) - Chair: Csaba Sárvári (Room 2.4)

-- Celina A. A. P. Abar and Ubirajara Carnevale De Moraes -- Flipped Classrooms and MOODLE: Digital Technologies To Support Teaching and Learning Mathematics

-- Robert Weinhandl and Zsolt Lavicza -- Teacher Training for a Technology-Enhanced Flipped Classroom in Mathematics Education

-- Umberto Dello Iacono, Anna Pierri and Eugenia Taranto - Peer review methodology in a blended course for teacher education

26/06 - (14h) - Chair: Csaba Sárvári (Room 2.4)

-- Mamdouh Soliman, Maryam Al-Kandari, Tony Houghton, Zsolt Lavicza and Theodosia Prodromou -- Enhancing teachers to integrate technology in teaching mathematics in Kuwaiti classrooms

-- Fabián Vitabar, Zsolt Lavicza and Markus Hohenwarter -- Training teachers to use technologies in mathematics lessons: identifying key experiences for a successful teachers' learning process

-- Kan Guo, Shuang Song and Lavicza Zsolt -- Influential Factors of Mathematics Teachers' Technological Pedagogical Content Knowledge in China

26/06 - (16h) - Chair: Zsolt Lavicza (Room 2.4)

-- Osama Swidan and Naomi Prusak -- Developing Pre-Service Teachers' Collaborative Learning and Argumentation Skills in Computer-Supported Collaborative Environments

-- Chantelle Bosch -- Cooperative learning as a strategy for self-directed learning in a blended-distance learning Mathematics environment

-- Ana Donevska-Todorova -- Applications of Congruence Transformations with Technology-Enhanced Materials

-- Valentyna Pikalova, Denys Stolbov and Mariia Kolesnik -- Designing and Creating IoT Devices with Pre-service Teachers

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**PS2 - 28/06 - (14h) - Chair: Zsolt Lavicza (Room 2.4)**

- Ilona Olahne Teglasi -- Introducing Complex Basic Program in Hungary's primary schools as a prevention against early school leaving
- Sofya Lyakhova -- Post-16 school students' experience of studying advanced mathematics courses online and face-to-face as an additional non-timetabled option

**28/06 - (16h) - Chair: Zsolt Lavicza (Room 2.4)**

- Dorothy Laubscher -- Technology supported design-based intervention to support teachers in implementing Realistic Mathematics Education
- Helena Koldová, Dagmar Melicharová, Vladimira Petraskova and Přemysl Rosa -- Interdisciplinary relations supporting propaedeutics of mathematics in primary education
- Cecilia Russo, Zsolt Lavicza and Fabian Vitabar -- Designing Gamification environments for the teaching and learning mathematics

**29/06 - (9h) - Chair: Csaba Sárvári (Room 2.5)**

- Gergely Wintsche and György Emese -- The Changing Usage of Teaching Tools in Hungary
- Ana Paula Lima Gandra, Ana Paula Aires and Paula Catarino -- Learning how to solve linear equation with Equation Buster
- Roi Shillo and Zsolt Lavicza -- Detecting students' creativity from data streams derived from online exercises
- Dragica Milinković and Slađana Mitrović -- Effects of different methodical approaches on solving the system of linear equations with two unknowns in the differentiated mathematics teaching

**PS3 - 26/06 - (11h) - Chair: Djordje Herceg (Room 2.5)**

- Thierry Dana-Picard and Sara Hershkovitz -- Tessellations: from childhood to cosmology
- Natalija Budinski, Zsolt Lavicza and Kristóf Fenyvesi -- Teaching basic mathematical concepts with Origami and GeoGebra for fifth-grade primary school students
- Bruno Leite Ferreira, Rúbia Schio and Zsolt Lavicza -- Aspects Considered To Prepare GeoGebra APPLETS for Understanding Generality of Conics

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**26/06 - (14h) - Chair: Diego Lieban (Room 2.5)**

- Daniel Milow -- Why and how an implementation of the rotational angle aspect can support students to develop a proper idea of angles
- Ana Cristina Oliveira -- ATRACTOR – Virtual Tools in Mathematics Communication
- Ildikó Perjési-Hámori -- Computer algebra systems (CAS) as a bridge between Mathematics and Engineering

**26/06 - (16h) - Chair: Ildikó Perjési-Hámori (Room 2.5)**

- Djordje Herceg, Dejana Herceg, Vera Herceg Mandić and Davorka Radakovic -- Subject-specific components in dynamic geometry software
- Světlana Tomiczková -- How to use Geometric Software in Courses of Differential Geometry
- Jorge Marques and Nuno Baeta -- The indifference curve analysis - An alternative approach represented by ODEs using GeoGebra
- Blanka Šedivá -- The using of Monte Carlo simulation in the teaching process