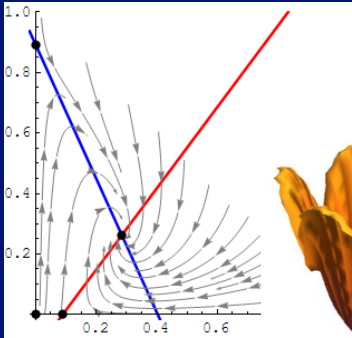


# Good News!

The cooperation on mathematical modeling is continuing !



## Szeged



## Novi Sad

# Preliminaries:



## INTERREG mirror projects, 2007 - 2008

**Univ. of Szeged:** Computer-aided Modeling and Simulation in Sciences  
**Univ. of Novi Sad:** Development of Computer-aided Methods in Teaching Mathematics and Science

## IPA HU-SRB HUSRB/0901/121/008, 2010 - 2011

Teaching Mathematics and Statistics in Sciences: Modeling and Computer-aided Approach

# Main Results:

- Teaching materials
- Electronic book
- [www.model.u-szeged.hu](http://www.model.u-szeged.hu)
- Interdisciplinary intensive schools in Novi Sad and Szeged
- Open lecturing days
- Modeling in Life Sciences conference series
- Pannonian Modeling Conference
- „Meet the professor” lectures
- New computer equipment, software tools
- Student exchange

# ... and now, a new project ...



**Hungary-Serbia**

IPA Cross-border Co-operation Programme

"GOOD NEIGHBOURS CREATING COMMON FUTURE"

„JÓ SZOMSZÉDOK A KÖZÖS JÖVŐÉRT”

“DOBRI SUSEDI ZAJEDNO STVARAJU BUDUĆNOST”

## Hungary-Serbia IPA Cross-border Co-operation Programme



The programme is financed by the European Union



**IPA HU-SRB HUSRB/0901/121/008, 2013 - 2014**

# **Non-Standard Forms of Teaching Mathematics and Physics: Experimental and Modeling Approach**

University of Szeged

Bolyai Institute, Department of Medical Physics and Medical Informatics

University of Novi Sad, Faculty of Sciences

Department of Mathematics and Informatics

Department of Physics

# Participants

Attila Dénes  
Diána Hulmán-Knipl  
Ádám Hulmán  
János Karsai  
Csilla Kertész  
József Kosztolányi  
Mónika van Leeuwen-Polner  
Péter Makra  
Attila Máder  
Gergely Röst  
Lajos Szilassi  
Júlia Tandori  
Róbert Vajda  
Zsolt Vizi

# Objectives

- Development and dissemination of "Non-standard", "Non-Traditional" forms and methods of practice- and application oriented teaching of Math and Physics
- Popularization and dissemination of modern teaching methods of sciences among teachers and young generation
- Strengthening the educational cooperations with other neighboring countries.
- Internationalizing of our results by joining to world-wide initiatives: Researchers' Night, ...
- Involving students in the cooperation.

# Planned activities

- Teaching developments in Mathematics
- Teaching developments in Physics
- Internat. intensive school (3-3 days in Szeged and Novi Sad)
- 3+2 Special courses (3-4 days)
- Open days (min. 2+2 events)
- Modeling in Life Sciences, Szeged
- Pannonian Modeling Conference, Novi sad
- Student exchange
- Project workshops, team trainings
- Information and publicity
- Procurements



# Teaching developments in Physics

*Júlia Tandori, Péter Makra, Olivera Klisurić*

Development on the computer-aided physics measurements, mainly focused on Medical Physics and High school Physics (Biopac and Edaq530 based)

## Output:

- Teaching materials
  - Medical Physics lab descriptions with BioPac and Edaq530 (HU-SRB-EN)
  - High School Physics lab experiment descriptions with Edaq530 (HU-SRB-EN)
  - Physics test database related to the Biopac and Edaq530 based materials
- Trainings for the developing team (1 day long trainings, Szeged, Novi Sad)
- An intensive advanced (PhD level) course (3 days)
- Classes on the intensive school
- Introductory trainings at schools (“Meet the professor”)

# Teaching developments in Mathematics

## ***Dynamic and mobile tools in Math education:***

*A. Máder, J. Kosztolányi, J. Karsai, J. Vajda, G. Röst, A. Dénes  
D. Takaci, Á. Takácsi, Srdjan Škrbić, Mirjana Mikalački*

Dynamic and mobile tools in math education; literature, experiences, current available applications, development of new dynamic teaching materials in the focused fields, preferring the availability on tablets and smart phones

## Output:

- Literature, collected software tools
- Training for the developing team
- Intensive didactic course (PhD level, 3 days)
- Classes on the intensive school
- Teaching materials using *available math software (Geogebra, Mathematica, ...)*

# Teaching developments in Mathematics



## ***Computer tools and numerical method of differential equations: Biomathematical modeling and math for sciences:***

*J. Kosztolányi, J. Karsai, G. Röst, A. Dénes, Á. Takácsi, Mónika van Leeuwen-Polner, Marko Nedeljkov, R. Vajda*

Development of experimental intensive as well as traditional curricula, including series of dynamic presentations and collections of computer experiments for Differential equations, Biomathematics and Math in sciences

### **Output:**

- Literature
- An intensive course on *Biomathematics and math. epidemiology* (3 days)
- An intensive course on *Computer tools and numerical method of differential equations* (3 days)
- Classes on the *intensive school* of the project
- Teaching materials and collections of experiments and problems using *available math software* (Geogebra, Mathematica, MatLab...)

# Teaching developments in Mathematics



## Teaching materials

### ***Experiments in Calculus: dynamic experiments (Mathematica, Geogebra)***

*J. Karsai, R. Vajda, Zs. Vizi, D. Takaci, Á. Takácsi, Srdjan Škrbić, Mirjana Mikalački*

### ***Experimental studies in population dynamics and epidemiology (Mathematica)***

*G. Röst, A. Dénes, J. Karsai, Á. Takácsi, É. V.P. Rácz (Győr)*

### ***Dynamic Geometry with Geogebra***

*L. Szilassi, A. Máder, D. Takaci*

### ***Computer tools and numerical method of differential equations***

*Mónika van Leeuwen-Polner, Marko Nedeljkov, J. Karsai, R. Vajda*

# Teaching developments in Mathematics

## Special tasks

*Ádám Hulmán, Srdjan Škrbić, Mirjana Mikalački, János Karsai, R: Vajda*

- Upgrading the stylesheets (Mathematica, MS-Wors, TeX, HTML)
- Platform experiments: Geogebra applets in HTML, PDF
- Tablet development possibilities
- **Preparation of a training for the team!**

# Milestones of the developments

## Periods:

	<b>Start</b>	<b>End</b>	<b>Report (JTS)</b>
<b>Period 1</b>	01.12.2013	31.03.2014	29.06.2014
<b>Period 2</b>	01.04.2014	31.07.2014	29.10.2014
<b>Period 3</b>	01.08.2014	30.11.2014	28.02.2015
<b>Period 4</b>	01.12.2014	31.03.2015	29.06.2015
<b>Period 5</b>	01.04.2015	31.05.2015	29.08.2015

# Milestones of the developments



*Dec. 1, 2013 - March 31, 2014*

Detailed specifications, platform, table of contents, dynamic elements,  
TOC specifications for the multimedia developer  
Stylesheets, document structures, multimedia  
Sample Chapter

*Apr. 1 - Nov 30, 2014*

Continuous development

*Sept. 1, 2014 - May 31, 2015:*

Dissemination of the results: Open days, courses, classes at the  
internat. school.

# Travel of team members



- Allowed: trips strictly related to the project
- Project events in Hungary and Serbia
- Travel cost, accommodation and per diem
- Budget: 5000 Eur



# Events

## Project workshops

Opening conference:	p1: February 2014
Workshop Novi Sad:	p2: June 2014
Workshop:	p3: October 2014
Workshop Novi Sad:	p4: June 2014
Closing conference:	p5: April 2015

## Project team trainings (by invited experts?)

Dynamic and mobile tools in education, Szeged (1-2 days):	p2
Dynamic and mobile tools in education, Novi Sad (1-2 days):	p2
Medical Physics Szeged (1 day)	p2
Medical Physics Novi Sad (1 day)	p3

# Events

## International courses (PhD. Level; 3-4 days)

### Szeged (3 courses planned)

Math. biology:	p2-p3
Computer tools for dynamic systems	p2-p3
Dynamic and mobile tools in math edu.	p2-p3
Medical Physics PhD course:	p2-p3

### Novi Sad (2 courses planned)

Fractional Calculus:	p2-p3
Computer tools for dynamic systems:	p2-p3

### Conditions

10-20 participants

Budget: 600 EUR /course

Accommodation, lunch, coffe break, folder, pen drive, handouts

Organizers: developers of the given fields

# Events

## International conferences

### Szeged

Modeling in life sciences: p3: november, 2014

### Novi Sad

Pannonian Math. Modelling Conf.: p5: April 25-26, 2015, closing in Novi Sad

### Conditions for Szeged

Budget: 1100 EUR (other sources may needed)

Coffe break, folder, promotion

Accommodation, travel, food for the invited speakers

Organizers: G. Röst, A. Dénes, J. Karsai

# Events

## International intensive school „Winter School”

- Time: 2015 January - February
- 3-3 days in Szeged and Novi Sad
- Organizers (Szeged): J. Karsai, J. Kosztolányi, J. Tandori
- Lectures by the team and others
- First announcement in September at the latests
- The same philosophy as before:
  - Interdisciplinarity
  - PhD level group
  - Group for high school students and teachers
  - Opening by „great persons and winners of the high school contest)
- Budget (Szeged): 4000 Eur
- Accommodation, coffee break, lunch, promotion, folder, DVD with handouts...

# Events

## Open days (min. 2+2 events)

### Szeged: (planned 2!!!)

Open day 1:

p2-p3 ???

Open day 2:(Fall cultural fest.):

p3: october, 2014

Open day 2 (in case of enough budget):

### Novi Sad (planned 2!!!)

Open days: Accredited Seminar mobil GeoGebra in math. Education.

Open day 1:

p1: Subotica, fall 2014, or early spring 2015

Open day 2:

p2: Senta, fall 2014, or early spring 2015

Open day 3:

p2: Zrenjanin, fall 2014, or early spring 2015

Open day 4:

p2: Pancevo, fall 2014, or early spring 2015

### Conditions for Szeged

Budget: 500 Eur/day

Coffe break, promotion

Organizers: J. Karsai, J. Kosztolányi, Zs. Vizi, E. Horváth

# Events

## Student exchange

- Should be focused on project events
- Budget (each partner): ~30 nights, 40 Eur/night: 1200 EUR
- Accommodation, food, the standard event materials

# Events

## Procurements

### Single tenders (>1000 Eur):

- Event-organization (now, January)
- 3 Laptops, 6 tablets, 2 projectors (January-February)
- Real-costs (computer-based)
- 20-30 Edaq530 (now, January)
- Web-multimedia development (after the plans of teaching materials: March)

### Small expenses

Information-materials

Real-costs (paper-based)

## Meet the Professors

Professors go to the school, and give lectures

- Physics: joint with Edaq530 presentation ceremonies
- Math: joint with regular visits to schools (continuous discussions with Eszter Horváth)
- 1-2 talks by each team member is expected



# Related conferences

- Annual meeting of Math. Society January 18-19. 2014
- GeoGebra Conference, Budapest 23-25 January, 2014
- Elementary Mathematics Education 2014, Olomouc, 23rd – 25th April, 2014,  
Congress of Serbian Mathematics, May 22-25, 2014.
- Mipro., 2014; 26-30. May 2014  
<http://www.mipro.hr/Home/tabid/36/language/en-US/Default.aspx>
- European Wolfram technology Conference, May 27-28, 2014, Frankfurt
- International Mathematica Symposium, 2014 December, Prague
- “Time” 1-5 July 2014, Krems, Austria, [www.time2014.org](http://www.time2014.org)
- Congress of Macedonian Mathematic, May 22-25, 2014.
- “Sisy” Subotica September September, 2014
- CADGME September, 2014

# Information and publicity

## General (J. Karsai and everybody!)

- Information – plates (January, February)
- Information boards (January, February)
- Opening article for newspapers (January)
- Closing summary for newspapers
- TV and Radio reports at conferences (continuously, at events)
- Photo sequences on the web site
- [www.model.u-szeged.hu](http://www.model.u-szeged.hu) contents development

## Activity materials in Mathematics and Physics

- A4 size, Polyhedra, something cut out?
- Ruler with patterns from Math and Physics
- Card (quick reference) with useful things and decorations
- Wooden activity tools (L. Szilassi, ????)
- Tasks
  - Procurements: J. Karsai, Cs. Kertész
  - Collecting patterns, contents, ideas (all of us, Zs. Vizi)
  - Design (Nárcisz Kulcsár, some money would be good!)
  - Deadline: the first events (April, May?)

# Information and publicity



## More tasks

- Continuous contact with the partners (J. Tandori, J. Karsai, J. Kosztolányi, E. Horváth, All of us!
- Select the candidates for V.I.P. partnership, who will receive an Edaq530 (March, 2014)
  - J. Tandori, J. Karsai, J. Kosztolányi, Dj. Takaci
  - 10-15 tools will be given
  - Start (or keep) special contact with them

# Summary of urgent tasks

- Summary and plans of teaching materials
- Summary of PhD courses for accreditation
- Information material design
- Platform and stylesheet design
- Invited expert (experts?)
- Schedule of courses

# Administrative duties

- Time sheet
- Travel documents immediately, travel reports
- Obligatory acknowledgment and design elements for IPA (mainly prepared)
- Use the prepared forms (Ask Csilla)