

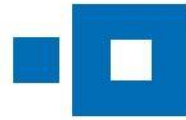
FINAL PROGRAM



22 – 24 September 2021



universidade
de aveiro



DigiMedia
digital media and interaction
research centre

Aveiro, Portugal
Organized and Sponsored by



AREA42



PROGRAMME AT A GLANCE

Due to COVID19 and the ensuing travel restrictions presentations will be online making GAME-ON 2021 an online event. Online presentations will be denoted with the affix ONL after the paper number.

All times in the programme are local times ([WEST — Western European Summer Time](#))

Videos and Slides of the online presentations will be made available to view for all GAME-ON 2021 participants only on the EUROSIS website.

Wednesday September 22

08.30-14.30 Registration
 09.00-09.30 Onsite and Online Welcome
 09.30-10.30 Keynote Simon See
 10.30-11.00 Coffee Break
 11.00-12.30 Session **Game Analysis & Theory**
 12.30-13.30 Lunch
 13.30-14.30 Keynote Sanaul Haque
 14.30-15.00 Coffee Break
 15.00-16.00 Session **Mobile Gaming**
 17.00 end of Day 1

Thursday September 23

08.30-15.30 Registration
 09.30-10.30 Keynote Maxim Mozgovoy
 10.30-11.00 Coffee Break
 11.00-12.30 Session **NPC'S and Avatars**
 12.30-13.30 Lunch
 13.30-14.30 Session **Gamification I**
 14.30-15.00 Coffee Break
 15.00-16.00 Session **Gamification II**
 16.00 end of Day 2

Friday September 24

08.30-12.30 Registration
 09.30-10.30 Keynote Davide Gaddia
 10.30-10.45 Coffee Break
 10.45-12.45 Session: **GAME AI**
 12.45-13.30 Lunch
 13.30-14.30 Workshop
 14.30-15.00 Coffee Break
 15.00-17.00 Roundtable Panel Discussion
 17.00-17.15 Closing Session
 End of Conference

GAME-ON'2021 FINAL PROGRAMME

Overhead and LCD Projector are standard. The room has a screen for online presentations
The underlined authors are usually the presenters.

Conference Site: **University of Aveiro, DECA Auditorium, Department of Communication and Art, Campus Universitário de Santiago, 3810-193 Aveiro /or ONLINE ROOM**

For any local information contact: 📞 Tel. :+351.234.370.389, ✉ Email: lilianavale@ua.pt,
Coffee breaks and lunches at the University or at the comfort of everybody's home

Only papers in gray boxes are eligible for the best paper award

Wednesday, September 22, 2021

08.30 - 14.30 **Registration**

09.00 - 09.30 **DECA Auditorium/Online Room - WELCOME**

Welcome and General Information

Paulo Jorge Ferreira, Rector of the University of Aveiro
Nelson Zagalo, DigiMedia Research Coordinator
Ana Veloso, GAME-ON'2021 General Conference Chair

Opening of GAME-ON'2021

Ana Veloso, GAME-ON'2021 General Conference Chair

09.30 - 10.30 **DECA Auditorium/Online Room - SESSION I**
KEYNOTE SPEAKER

09.30-10.30

Session Chairperson:

Nelson Zagalo, DigiMedia, University of Aveiro, Aveiro, Portugal



GAME_KEY_01_ONL

[AI and Games Technology](#)

Simon See, Senior Director, Nvidia AI Technology Center, Singapore

Wednesday, September 22, 2021

10.30 - 11.00 **Coffee Break**

11.00 - 12.30 **DECA Auditorium/Online Room - SESSION II
GAME ANALYSIS & THEORY**

11.00-12.30

Session Chairperson:

Esteban Clua, Computer Science Department, Universidade Federal Fluminense, Brazil

GAME_01_AN_METH_ONL

The Wolf among Us: Heuristic Evaluation of a Digital Game with Narrative

Cláudia Ortet, Tânia Ribeiro and Ana Isabel Veloso 5

GAME_02_AN_METH_ONL

FEZ Game – An Heuristic Evaluation

Francisco Regalado, Tânia Ribeiro and Ana Isabel Veloso..... 12

GAME_METH_04_ONL

Bursted Behavior Trees

Jiří Berny and Jakub Gemrot 19

12.30 - 13.30 **Lunch**

13.30 - 14.30 **DECA Auditorium/Online Room - SESSION III
KEYNOTE SPEAKER**

13.30-14.30

Session Chairperson:

Liliana Costa, DigiMedia, University of Aveiro, Aveiro, Portugal



INV_03_ONL

[Sustainable Resilient Gamified Digital Solutions for the Next Generation](#)

Sanaul Haque, LUT University, Lappeenranta, Finland

Wednesday, September 22, 2021

14.30 - 15.00 **Coffee Break**

15.00 - 16.00 **DECA Auditorium/Online Room - SESSION IV
MOBILE GAMING**

15.00-16.00

Session Chairperson:

Mónica Aresta, DigiMedia, University of Aveiro, Aveiro, Portugal

GAME_PER_01_METH_ONL

**Gamification Design Patterns and Touchscreen Interactions in
Mobile Apps for Senior Citizens: An Overview**

Cláudia Ortet, Liliana Costa and Ana Isabel Veloso.....113

GAME_MOBILE_VR_01_ONL

MusA: a Gamified Virtual Reality Museum

Fernando Sousa, José Nunes, Carlos Santos, João Magalhães,
Joaquim Moreira and Mário Vairinhos.....120

FREE EVENING

Thursday, September 23, 2021

08.30 - 15.30 Registration

09.30 - 10.30 DECA Auditorium/Online Room - SESSION V
KEYNOTE SPEAKER

09.30-10.30

Session Chairperson:

Antonio Coelho, FEUP, University of Porto, Porto, Portugal



INV_02_ONL

[AI at Heart: Experiences of a Mobile Game Developer](#)

Maxim Mozgovoy, The University of Aizu, Aizuwakamatsu, Fukushima, Japan

10.30 - 11.00 Coffee Break

11.00 - 12.30 DECA Auditorium/Online Room - SESSION VI
NPC'S AND AVATARS

11.00-12.30

Session Chairperson:

José Nunes, DigiMedia, University of Aveiro, Aveiro, Portugal

GAME_OPP_01_ONL

Identification of Play Styles in Universal Fighting Engine

Kaori Yuda, Shota Kamei, Riku Tanji, Ryoya Ito, Ippo Wakana
and Maxim Mozgovoy 72

GAME_AI_3_OPP_ONL

**Combining Reinforcement Learning with Finite-State Machines
for Non-Player Characters**

Joshua Damasio, Gil Lopes and Cláudia Freitas 59

GAME_DES_03_ONL

**Why we play whom we play: On the Correlation between Player
Personality and Choice of Avatar**

Lukas Keuter and Emmanuel Guardiola 64

Thursday, September 23, 2021

12.30 - 13.30 **Lunch**

13.30 - 14.30 **DECA Auditorium/Online Room - SESSION VII
GAMIFICATION I**

13.30-14.30

Session Chairperson:

Carlos Santos, DigiMedia, University of Aveiro, Aveiro, Portugal

GAMIF_01_DES_ONL

Designing a Gamified Self-Compassion Training

L.M. van der Lubbe, C. Gerritsen, M.C.A. Klein, K.V. Hindriks
and R.F. Rodgers.....**79**

GAMIF_03_ONL

A Pilot Study of a Gamified Self-Compassion Training

L.M. van der Lubbe, C. Gerritsen, M.C.A. Klein, K.V. Hindriks
and R.F. Rodgers.....**86**

14.30 - 15.00 **Coffee Break**

15.00 - 16.00 **DECA Auditorium/Online Room - SESSION VIII
GAMIFICATION II**

15.00-16.00

Session Chairperson:

Luis Pedro, DigiMedia, University of Aveiro, Aveiro, Portugal

GAMIF_05_ONL

“Gamification for All”: Planning and Designing a Community-Oriented Gamification Strategy

Francisco Regalado, João Henrique Silva, Sónia Machado, Liliana Vale Costa, Ana Veloso, Carlos Santos and Óscar Mealha**94**

GAME_SER_01_ONL

OutSmart! Evaluation of a Serious Game and its Conversational Interface for Reflective Social Media Use

Barbara Göbl, Dayana Hristova, Suzana Jovicic, Simone Kriglstein
and Helmut Hlavacs.....**102**

FREE EVENING

Friday, September 24, 2021

08.30 - 12.30 Registration

09.30 - 10.30 DECA Auditorium/Online Room - SESSION IX
KEYNOTE SPEAKER

09.30-10.30

Session Chairperson:

Mario Vairinhos, DigiMedia, University of Aveiro, Aveiro, Portugal



INV_01_ONL

[An\(other\) overview of Procedural Content Generation Techniques applied to Game Design and Development](#)

Davide Gadia, Università degli Studi di Milano, Milan, Italy

10.30 - 10.45 Coffee Break

10.45 - 12.45 DECA Auditorium/Online Room - SESSION X
GAME AI

10.45-12.45

Session Chairperson:

Pedro Beça, DigiMedia, University of Aveiro, Aveiro, Portugal

GAME_DES_01_ONL

Solitaire Paper Automation: When Solitaire Modern Board Game Modes Approach Artificial Intelligence

Micael Sousa and Marco Silva 35

GAME_AFFECT_01_ONL

Towards Effectively Adapting Games: What needs to be Conquered to Achieve Adaptation

Phil Lopes and Micaela Fonseca 43

GAME_LEARN_01_ONL

Human vs Wavefunctioncollapse (WFC) Video Game City General Challenge

Werner Gaisbauer and Helmut Hlavacs 51

Friday, September 24, 2021

GAME_AI_01_ONL

Towards Training Swarms for Game AI

Estefano Palacios and Enrique Peláez.....27

12.45 - 13.30 **Lunch**

13.30 - 14.30 **DECA Auditorium/Online Room - SESSION XI
WORKSHOP**

13.30-14.30

Workshop Chairperson:

Pedro Cardoso, DigiMedia, University of Aveiro, Aveiro, Portugal



WORK_01_ONL

[Using Modern Board Game Mechanisms to develop Simple Analog Serious Games](#)

Micael Sousa, University of Coimbra, Coimbra, Portugal

14.30 - 15.00 **Coffee Break**

15.00 - 17.00 **DECA Auditorium/Online Room - SESSION XII
ROUND TABLE DISCUSSION**

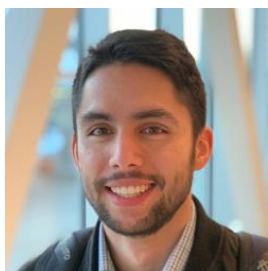
15.00-17.00

Roundtable Moderator:

Liliana Vale Costa, University of Aveiro, Aveiro, Portugal

RTD_01_ONL

[The Use of Digital Games and AI for Health and Wellbeing](#)



Luis Quintero, Data Science Group, Stockholm University, Stockholm, Sweden



Ricardo Velásquez, Alternova, Newark, USA



John Edison Muñoz Cardona, University of Waterloo, Canada

Friday, September 24, 2021

17.00 - 17.15 DECA Auditorium/Online Room - SESSION XIII
CLOSING SESSION AND BEST PAPER AWARD

17.00-17.15

Session Chairperson:

Ana Veloso, DigiMedia, University of Aveiro

Óscar Mealha, DigiMedia, University of Aveiro

Philippe Geril, EUROSIS-ETI, Ostend, Belgium

SESSION CHAIR INFORMATION

Information for Session Chairs

Session Chairs are chosen on a voluntary basis by proposals by either authors or local committee members or are appointed by the Track Chairs, General Program Chair or General Conference Chair. They are responsible for their assigned session. They make sure their speakers are available, take care of the timing within the session, chair the discussion after each presentation and introduce each speaker based on the CV's given to them by the authors. In case they chair a session featuring **extended papers**, then they are required to distribute and collect the reviews of that or those papers at the beginning and end of the session. If they have time they should also indicate in their papers the number of session participants.

THE NUMBERS NEXT TO THE PRESENTATIONS DENOTE THE PAGE-NUMBERS IN THE PROCEEDINGS. IF NO NUMBERS ARE MENTIONED THEN THIS PAPER IS NOT PUBLISHED IN THE PROCEEDINGS

THE AUTHORS WHO ARE UNDERLINED ARE NORMALLY THE PRESENTERS

ONLY PAPERS IN GREY BOXES ARE THE EXTENDED PAPERS ELIGIBLE FOR THE BEST PAPER AWARD

PAPER NUMBERS IN THE FINAL PROGRAMME FOLLOWED BY "ONL" MEAN THESE PAPERS WILL BE PRESENTED ONLINE

GAME 2022 FIRST ANNOUNCEMENT



**SEE YOU ALL NEXT YEAR AT GAME-ON® 2022
September 2022
Location to be announced soon**

Proposals for special tracks/tutorials/demos can be sent in by November 10th 2021

CONFERENCE LOCATION

Conference Venue




[University of Aveiro](http://www.ua.pt)

DeCA auditorium

Department of Communication and Art

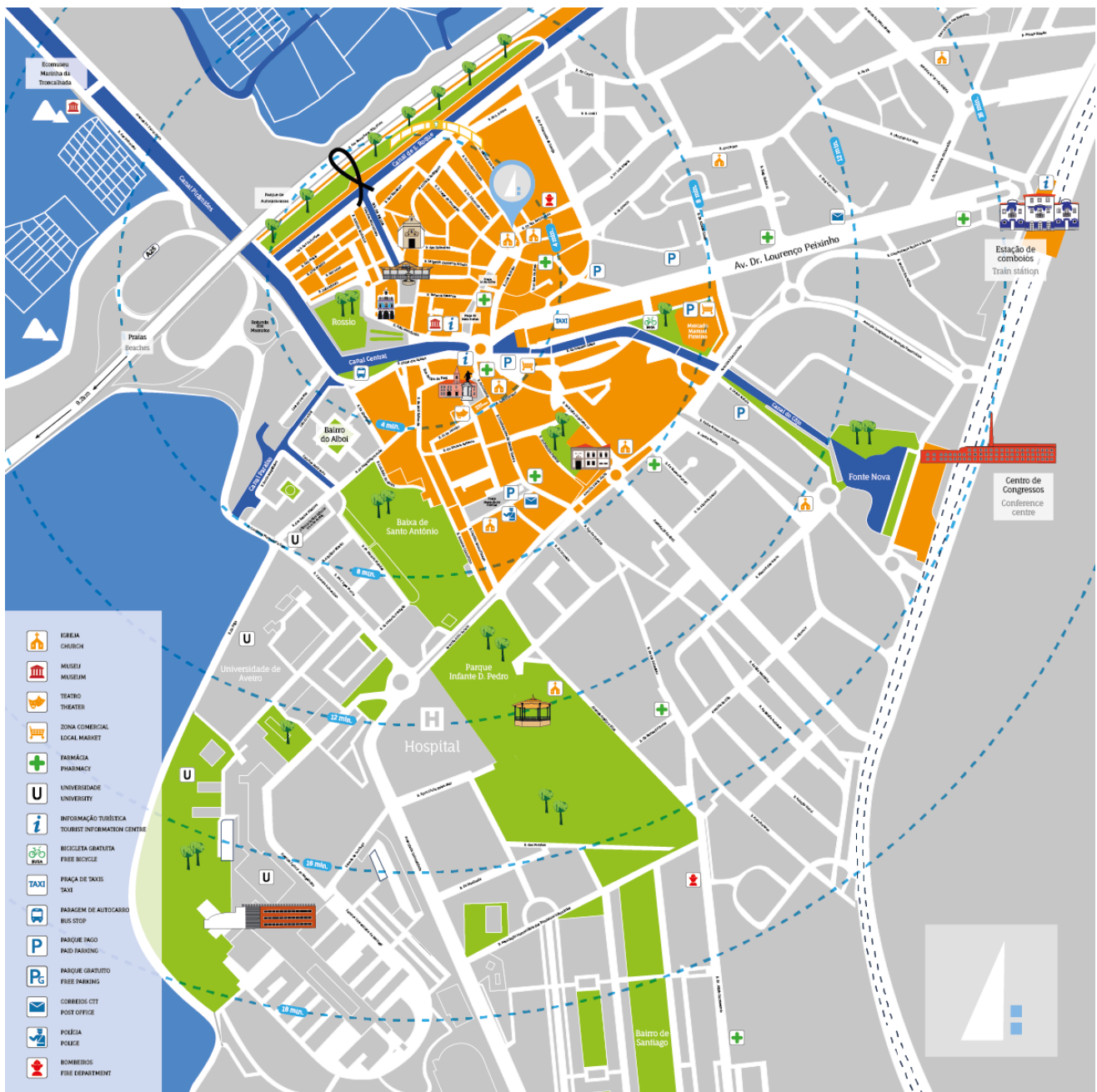
Campus Universitário de Santiago

3810-193 Aveiro

 Tel. :+351.234.370.389

 Email: lilianavale@ua.pt

Aveiro Map



CONFERENCE LOCATION

How to Reach Aveiro

By Plane

When travelling to Aveiro by plane, the closest airport will be [Francisco Sá Carneiro International Airport](#) in Oporto, located some 70 kms to the north of Aveiro. Your other possible point of entry by plane would be [Portela International Airport](#) - (other [website](#)) in Lisbon which is located 250 kms to the south of Aveiro.

From Oporto Airport to Aveiro by train

The trip between the airport and the **two main Porto railway stations** (called [Porto-Campanhã](#) and [Porto São Bento](#)), which have direct rail connections to Aveiro, can be done by taxi for around €20 and takes around 20-30 minutes. A less expensive way to reach the **Porto-Campanhã and Porto São Bento** railway stations is to use the Metro (**E line**), which has [a terminal](#) at the airport. The trips between the airport and the railway stations take about 32 minutes and the ticket costs €1,85 (Z4 ticket). Click [here](#) for **Metro information**. The train journey to Aveiro takes between 40 minutes and 1h15, depending on the type of train and train station used. The best choice of train service is the inexpensive urban train service (**Urbano**), which provides a direct route to Aveiro with a journey time of 1h15. A single ticket from Porto to Aveiro costs €3.55/€1.80 (adult/child), and the return ticket is the price of two singles €7.10/€3.60 (adult/child). The journey falls within " Zone 9" pricing bracket of the Porto urban train lines. There are also **express trains** (called **Intercidades IC or Alfa Pendular**), which take 43-53 minutes, but these trains are significantly more expensive (from € 11.70 to € 19.70) and require a connection at [Porto-Campanhã](#). For a detailed fare guide, please see the [CP website](#): Click [here](#) for **IC train timetables**.

From Lisbon Airport to Aveiro by train

If you're arriving by plane, the simplest form of transport to Aveiro is by train from [Gare do Oriente trainstation](#). To get to the train station, you can go by taxi, which takes about 10 minutes and costs around €10, but there are less expensive ways to get there, by bus, for example. A ticket to the city center should cost €1.35. One also has an option of purchasing an all day ticket at €3.35. **AEROBUS**: Linking the Airport to downtown Lisbon and Cais do Sodre (every 20 minutes from 7 a.m. to 9 p.m.) **CARRIS BUSES**: No. 5, 8, 22, 44, 45, 83 or by [metro](#) (red line, buying the " Viva Viagem" card, €0,50 along with the 1 hour Travel Ticket, €1,40). There are regular direct trains to Aveiro from [Gare do Oriente trainstation](#). Given the distance between Lisbon and Aveiro, it is best to use the fast train services (Alfa or Intercidades). The train journey from Lisboa-Oriente to Aveiro using the Alfa and Intercidades trains takes around 2h30m and costs up to €25. There is (at least) one train every hour from 6.00 AM to 9.30 PM. Click [here](#) for train timetables.

From Porto Airport by car

At the airport there are various car hire agencies. Follow the signs for the **A1 motorway in the direction of Lisbon** (there is a toll charge of around €3.5, and can be paid in cash or with a credit/debit card). **Leave the A1 at the exit for Aveiro and take the A25**. The University is near the hospital.

CONFERENCE LOCATION

From Lisbon Airport by car

At the airport there are various car hire agencies. Follow the signs for the **A1 motorway in the direction of Porto** (there is a toll charge that can be paid in cash is around €15 or with a credit/debit card). **Leave the A1 at "Aveiro-Sul/Águeda" (exit 15) and take the EN235 directly to the city centre.** The University is near the hospital.

By Train

As stated above Aveiro, is linked with all major cities in the rest of Portugal by the **Alfa Pendular** (between Lisbon and Braga; Lisbon and Oporto; Faro and Oporto) and **Intercity** (between Lisbon and Oporto as well as Lisbon and Guimarães) trains. Furthermore suburban links through the **Urbanos** do Porto and, also, the Linha do Vouga, a narrow gauge railway to Águeda and Sernada do Vouga. [Aveiro railway station](#) is located about **20 minutes walking distance** or **5 minutes taxi ride** from the University Campus. To reach the Campus, you can also use the [bus \(green line\)](#) which departs at regular intervals from outside the railway station.

By Bus

From Porto

There is no point taking the intercity bus from Porto to Aveiro as the journey is much longer, the fares are more expensive, and there are fewer departures.

From Lisbon The intercity bus network is operated by [Rede Expressos](#), and their fastest route takes 1h25, but some services take over 2 hours. An adult single fare costs €8.60 and a return is €15.40. Further information and the booking of tickets can be made on the [Rede Expressos](#) website. Rede Expressos buses depart from the Campo 24 de Agosto bus station, which is to the east of the city. The bus station is close to the 24 de Agosto metro station, and is only a short walk across the Jardim do Campo 24 de Agosto Park.

By Taxi

Taxis are available at the Aveiro train station. To calculate the price of a local taxi ride use this [fare calculator](#).

- Taxis Rodrigues Aveiro: Tel: +351 915 003 547
- TAXI 41, AVEIRO - Tel: +351 964 836 902

By Car

Aveiro is located 40 minutes away from Oporto, 2 hours from Lisbon (motorway A1) and only 2 hours from Spain (motorway A25).

- **From north, using the A1 motorway, or from the east, using the IP5/A25, follow in the direction of Lisbon.** Exit the A1 in the direction of Aveiro and take the IP5/A25. There are two exits to the city from the IP5/A25, first "Aveiro-Norte" and some kilometres further on, the "Aveiro" exit. This second exit is best for reaching the University of Aveiro (the University is near the Hospital).
- **From the south, using the A1 motorway, follow in the direction of Porto.** Exit the motorway at "Aveiro-Sul/Águeda" (exit 15) and follow the EN235 road directly to the University Campus (the University is near the hospital). From the south, using the A8 and A17 motorways, exit at "Aveiro-Sul" and follow the EN235 road directly to the University campus (the University is near the hospital).

These motorways have a system of electronic payment: please see the electronic toll [website](#) for more info.

EUROSIS upcoming Conferences

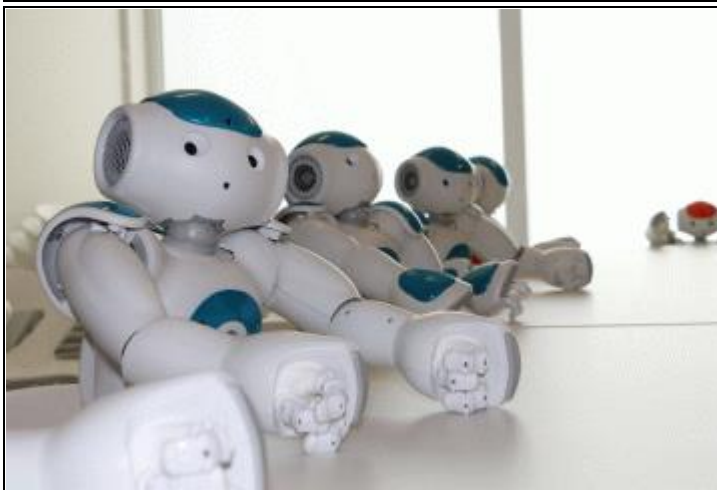


[ESM'2021](#)

October 27-29, 2021

Online Event

Rome, Italy



[SCIFI-IT'2022](#)

April 3-6, 2022,

[University of Leuven/Ghent Research Centre,](#)
Ghent, Belgium



[FOODSIM'2022](#)

April 3-6, 2022

[University of Leuven/Ghent Research Centre,](#)
Ghent, Belgium



[ISC'2022](#)

June 1-3, 2022


[UCD Dublin,](#) Ireland.



EUROSIS was borne out of discussions with the European Community to set up a new kind of Society, which would be project driven instead of driven by pure membership and conferences.

The aim of the new Society is to set up topic related Technical Committees which link directly to European Projects in the field of computer simulation and related areas and to act as a knowledge pool for future European Networks of Excellence, like MOSAIC.

If you would like to receive more information about EUROSIS, please contact

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Email:.....