<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td><strong>Tuesday, August 14</strong></td>
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<tr>
<td>8:30-9:15</td>
<td>Registration <em>(Ad Fundum)</em></td>
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<tr>
<td>9:15-9:30</td>
<td>Opening <em>(Aula)</em></td>
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<tr>
<td>9:30-10:30</td>
<td>Keynote I: Julian Schrittwieser <em>(Aula)</em></td>
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<tr>
<td>10:30-11:00</td>
<td>Coffee Break <em>(Ad Fundum)</em></td>
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<tr>
<td>11:00-12:40</td>
<td>Best Paper Session I <em>(Aula)</em></td>
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<tr>
<td>12:40-13:40</td>
<td>Lunch <em>(Mensa)</em></td>
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<tr>
<td>13:40-14:30</td>
<td>Best Paper Session II <em>(Aula)</em></td>
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<td>14:30-15:20</td>
<td>Session 1 <em>(Aula)</em></td>
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<td>15:20-15:50</td>
<td>Coffee <em>(Ad Fundum)</em></td>
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<tr>
<td>15:50-17:05</td>
<td>Poster - Demo Session <em>(Ad Fundum)</em></td>
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<tr>
<td>17:30-18:30</td>
<td>Reception <em>(City Hall)</em></td>
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<tr>
<td><strong>Wednesday, August 15</strong></td>
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<tr>
<td>8:30-9:00</td>
<td>Registration <em>(Ad Fundum)</em></td>
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<tr>
<td>9:00-10:00</td>
<td>Keynote II: Elisabeth André <em>(Aula)</em></td>
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<td>10:00-10:30</td>
<td>Coffee Break <em>(Ad Fundum)</em></td>
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<td>10:30-12:20</td>
<td>Session 2 <em>(Aula)</em></td>
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<tr>
<td>12:20-13:50</td>
<td>Lunch <em>(Mensa)</em> &amp; GTC Meeting <em>(Aula 13:00-13:45)</em></td>
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<tr>
<td>13:50-15:30</td>
<td>Special Session 1 <em>(Aula)</em></td>
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<td>15:30-16:00</td>
<td>Coffee Break <em>(Ad Fundum)</em></td>
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<td>16:00-18:00</td>
<td>Competitions <em>(Aula)</em></td>
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<td><strong>Thursday, August 16</strong></td>
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<tr>
<td>8:30-9:00</td>
<td>Registration <em>(Ad Fundum)</em></td>
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<td>9:00-10:00</td>
<td>Keynote III: Jens Piesk <em>(Aula)</em></td>
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<td>10:00-10:30</td>
<td>Coffee Break <em>(Ad Fundum)</em></td>
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<td>10:30-12:20</td>
<td>Session 4 <em>(Aula)</em></td>
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<td>12:20-13:30</td>
<td>Lunch <em>(Mensa)</em> &amp; ToG Meeting</td>
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<td>13:30-15:10</td>
<td>Session 5a <em>(Aula)</em></td>
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<tr>
<td>15:45-18:00</td>
<td>Boat Tour <em>(Rederij Stiphout)</em></td>
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<td>19:00-22:00</td>
<td>Diner <em>(Thiessen Wijnkoopers)</em></td>
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<td><strong>Friday, August 17</strong></td>
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<td>8:30-9:00</td>
<td>Registration <em>(Ad Fundum)</em></td>
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<td>9:00-10:00</td>
<td>Keynote IV: Arjen Beij <em>(Aula)</em></td>
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<td>10:00-10:30</td>
<td>Coffee Break <em>(Ad Fundum)</em></td>
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<td>10:30-12:20</td>
<td>Session 6 <em>(Aula)</em></td>
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<td>12:20-13:50</td>
<td>Lunch <em>(Mensa)</em></td>
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<td>13:50-15:30</td>
<td>Session 7a <em>(Aula)</em></td>
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<td>15:30-16:00</td>
<td>Coffee Break <em>(Ad Fundum)</em></td>
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<td>16:00-17:15</td>
<td>Session 8 <em>(Aula)</em></td>
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<td>17:15-17:45</td>
<td>Closing <em>(Aula)</em></td>
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Sessions Overview

Tuesday August 14

Best Paper Session I
Chair: Jialin Liu
Aula, 11:00-12:40
- 11:00-11:25: Hendrik Baier and Peter I. Cowling. *Evolutionary MCTS for Multi-Action Adversarial Games*
- 11:25-11:50: Christoph Salge, Christian Guckelsberger, Rodrigo Canaan and Tobias Mahlmann. *Accelerating Empowerment Computation with UCT Tree Search*
- 11:50-12:15: Raluca Gaina, Simon Lucas and Diego Perez Liebana. *General Win Prediction from Agent Experience*
- 12:15-12:40: Christian Guckelsberger, Christoph Salge and Julian Togelius. *New and Surprising Ways to be Mean: Adversarial NPCs with Coupled Empowerment Minimisation*

Best Paper Session II
Chair: Mike Preuss
Aula, 13:40-14:30
- 14:05-14:30: Cameron Browne. *Modern Techniques for Ancient Games*

Session 1: Real-Time Strategy Games
Chair: Santiago Ontañón
Aula, 14:30-15:20
- 14:30-14:55: Mike Preuss, Thomas Pfeiffer, Vanessa Volz and Nicolas Pflanzl. *Integrated Balancing of an RTS Game: Case Study and Toolbox Refinement*

Poster and Demo Session
Ad Fundum, 15:50-17:05
Posters:
- Garry Greenwood, Hussein Abbass and Eleni Petraki. *A Critical Analysis of Punishment in Public Goods Games*
- Aavaas Gajurel, Sushil J. Louis, Daniel J. Méndez and Siming Liu. *Neuroevolution for RTS Micro*
- Ryota Ishii, Suguru Ito, Makoto Ishihara, Tomohiro Harada and Ruck Thawonmas. *Monte-Carlo Tree Search Implementation of Fighting Game AIs Having Personas*
- Amin Babadi, Kourosh Naderi and Perttu Hämäläinen. *Intelligent Middle-Level Game Control*
- Makoto Ishihara, Suguru Ito, Ryota Ishii, Tomohiro Harada and Ruck Thawonmas. *Monte-Carlo Tree Search for Implementation of Dynamic Difficulty Adjustment Fighting Game AIs Having Believable Behaviors*
- Fernando De Mesentier Silva, Julian Togelius, Frank Lantz and Andy Nealen. *Generating Novice Heuristics for Post-Flop Poker*
• Zuozhi Yang and Santiago Ontañón. Learning Map-Independent Evaluation Functions for Real-Time Strategy Games
• Sandra Kaczmarek and Sintija Petroviča. Promotion of Learning Motivation through Individualization of Learner-Game Interaction
• Samuel Mascarenhas, Manuel Guimarães, Rui Prada, João Dias, Pedro A. Santos, Kam Star, Ben Hirsh, Ellis Spice and Rob Kommeren. A Virtual Agent Toolkit for Applied Game Developers
• Chrysanthi Tziortzioti, Irene Mavrommati, Georgios Mylonas, Andrea Vitaletti and Ioannis Chatzigiannakis. Scenarios for Educational and Game Activities using Internet of Things Data.
• Emil Gensby, Anders Harbøll Christiansen and Bo Friis Nielsen. Multi-Parametrised Matchmaking: A Framework
• Adam Streck and Thomas Wolbers. Using Discrete Time Markov Chains for Control of Idle Character Animation
• Martin L.M. Rooijackers and Mark H. M. Winands. Wall Building in the Game of StarCraft with Terrain Considerations
• Yoshina Takano, Wenwen Ouyang, Suguru Ito, Tomohiro Harada and Ruck Thawonmas. Applying Hybrid Reward Architecture to a Fighting Game AI
• Jichen Zhu, Antonios Liapis, Sebastian Risi, Rafael Bidarra and Michael Youngblood. Explainable AI for Designers: A Human-Centered Perspective on Mixed-Initiative Co-Creation

Demo:
• Baek In-Chang and Kim Kyung-Joong. Web-based Interface for Data Labeling in StarCraft
Wednesday August 15

Session 2: Decision Making  
Chair: Raluca Daniela Gaina  
Aula, 10:30-12:20
- 10:30-10:55: Philip Rodgers, John Levine and Damien Anderson. Ensemble Decision Making in Real-Time Games
- 11:50-12:15: Simon M. Lucas. Game AI Research with Fast Planet Wars Variants

Tutorial 1: Conducting Machine Learning Research within Custom-made 3D Game Environments  
Miguel Suau  
H0.06, 10:30-12:20

Special Session 1: Deep Learning in Games  
Chairs: Niels Justesen & Philip Bontrager  
Aula, 13:50-15:30
- 14:15-14:40: Jack Harmer, Linus Gisslén, Jorge del Val, Henrik Holst, Joakim Bergdahl, Tom Olsson, Kristoffer Sjöö and Magnus Nordin. Imitation Learning with Concurrent Actions in 3D Games
- 14:40-15:05: Niels Justesen and Sebastian Risi. Automated Curriculum Learning by Rewarding Temporally Rare Events

Session 3: Board Games and Puzzles  
Chair: Cameron Browne  
H0.06, 13:50-15:30
- 14:15-14:40: Daniel Ashlock and Courtney Kolthof. Evolving Number Sentence Puzzles
- 15:05-15:30: Magnus Gedda, Mikael Zayenz Lagerkvist and Martin Butler. Monte-Carlo Methods for the Game Kingdomino

Competitions  
Chair: Diego Perez-Liebana  
Aula, 16:00-18:00
- Short Video Competition
- Hearthstone Al
- The Ms. Pac-Man Vs Ghost Team Competition
- Fighting Game AI Competition
- microRTS Competition
• Hanabi Competition
• StarCraft AI Competition
• The General Video Game AI Competition – Learning Track
• 3rd Angry Birds Level Generation Competition
• The Text-Based Adventure AI Competition
• Visual Doom AI Competition 2018

Special Session 2: Intelligent Games for Learning
Chair: Bradford Mott
H0.06, 16:00-17:00
• 16:00-16:25: Maria Cutumisu. *The Influence of Feedback Choice on University Students’ Revision Choices and Performance in a Digital Assessment Game*
• 16:25-16:50: Gabriel Toschi de Oliveira, Hugo Henriques Pereira, Claudio Fabiano Motta Toledo, Seiji Isotani and Geiser Chaclo Challco. *A Plot from the Stars: Educational Game Development for Teaching Basic Mathematical Functions*
• 16:50-16:55: Sandra Kaczmarek and Sintija Petroviča. *Promotion of Learning Motivation through Individualization of Learner-Game Interaction*
• 16:55-17:00: Samuel Mascarenhas, Manuel Guimarães, Rui Prada, João Dias, Pedro A. Santos, Kam Star, Ben Hirsh, Ellis Spice and Rob Kommeren. *A Virtual Agent Toolkit for Applied Game Developers*

Special Session 3: Integrating IoT technologies with Serious Games
Chair: Evaggelos Spyrou
H0.06, 17:00-17:55
• 17:00-17:25: Evaggelos Spyrou, Nicholas Vretos, Andrew Pomazanskyi, Stylianos Asteriadis and Helen Leiligou. *Exploiting IoT Technologies for Personalized Learning*
• 17:25-17:50: Pavlos Kosmides, Konstantinos Demestichas, Evgenia Adamopoulou, Nikos Koutsouris, Yannis Oikonomidis and Vanessa De Luca. *InLife: Combining Real Life with Serious Games using IoT*
• 17:50-17:55: Chrysanthi Tziortzioti, Irene Mavrommati, Georgios Mylonas, Andrea Vitaletti and Ioannis Chatzigiannakis. *Scenarios for Educational and Game Activities using Internet of Things Data.*
Thursday August 16

Session 4: Search
Chair: Mark Winands
Aula, 10:30-12:20
- 10:30-10:55: Devon Sigurdson, Vadim Bulitko, William Yeoh, Carlos Hernández and Sven Koenig. *Multi-Agent Pathfinding with Real-Time Heuristic Search*

Tutorial 2: Learning to Play: The Multi-Agent Reinforcement Learning on Malmo Competition
Diego Perez-Liebana & Raluca Daniela Gaina
H0.06, 10:30-12:20

Session 5a: Competition Agents
Chair: Diego Perez-Liebana
Aula, 13:30-15:10
- 13:55-14:20: Maciej Świechowski, Tomasz Tajmajer and Andrzej Janusz. *Improving Hearthstone AI by Combining MCTS and Supervised Learning Algorithms*
- 14:20-14:45: Alexander Dockhorn and Daan Apeldoorn. *Forward Model Approximation for General Video Game Learning*
- 14:45-15:10: Kun Shao, Dongbin Zhao, Nannan Li and Yuanheng Zhu. *Learning Battles in ViZDoom via Deep Reinforcement Learning*

Session 5b: Game Design
Chair: Daniel Ashlock
H0.06, 13:30-15:10
- 14:20-14:45: Michael Cook, Simon Colton and Azalea Raad. *Inferring Design Constraints From Game Ruleset Analysis*
- 14:45-15:10: Daniel Karavolos, Antonios Liapis and Georgios N. Yannakakis. *Using a Surrogate Model of Gameplay for Automated Level Design*
Session 6: Machine Learning I
Chair: Simon Lucas
Aula, 10:30-12:20
- 10:30-10:55: Mohammed Salem, Antonio Mora and Juan J. Merelo. The Evolutionary Race: Improving the Process of Evaluating Car Controllers in Racing Simulators
- 11:50-12:15: Stefan Gudmundsson, Philipp Eisen, Erik Poromaa, Alex Nodet, Sami Purmonen, Richard Meurling, Bartlomiej Kozakowski and Lele Cao. Human-Like Playtesting with Deep Learning

Tutorial 3: Ranking Mechanisms in Games
Boris Naujoks & Vanessa Volz
H0.06, 10:30-12:20

Session 7a: Machine Learning II
Chair: Vanessa Volz
H0.06, 13:50-15:30
- 14:15-14:40: Myat Aung, Valerio Bonometti, Anders Drachen, Peter Cowling, Athanasios Kokkinakis and Alex Wade. Predicting Skill Learning Outcomes in a Large, Longitudinal MOBA dataset
- 14:40-15:05: Luiz Bernardo Martins Kummer, Júlio César Nievola and Emerson Cabrera Paraiso. Applying Commitment to Churn and Remaining Players Lifetime Prediction
- 15:05-15:30: Chrysoula Varia, Georgios Tsatiris, Kostas Karpouzis and Stefanos Kollias. A Refined 3D Dataset for the Analysis of Player Actions in Exertion Games

Session 7b: Card and Mathematical Games
Chair: Chiara Sironi
H0.06, 13:50-15:30
- 13:50-14:15: Sam Ganzfried and Qinyung Sun. Bayesian Opponent Exploitation in Imperfect-Information Games
- 14:15-14:40: Zhengxing Chen, Chris Amato, Truong Nguyen, Seth Cooper, Yizhou Sun, and Magy Seif El-Nasr. Q-DeckRec: a Fast Deck Recommendation System for Collectible Card Games
- 14:40-15:05: Daniel Ashlock, Eun-Youn Kim and Diego Pérez-Liébana. Toward General Mathematical Game Playing
- 15:05-15:30: Rutger Kraaijer, Marc van Kreveld, Wouter Meulemans and André van Renssen. Geometry and Generation of a New Graph Planarity Game
Session 8: Vision Papers
Chair: Julian Togelius
Aula, 16:00-17:15

- 16:00-16:25: Cristina Guerrero-Romero, Simon Lucas and Diego Perez-Liebana. Using a Team of General AI Algorithms to Assist Game Design and Testing
- 16:25-16:50: Rodrigo Canaan, Stefan Menzel, Julian Togelius and Andy Nealen. Towards Game-based Metrics for Computational Co-Creativity
- 16:50-17:15: Vanessa Volz, Kevin Majchrzak and Mike Preuss. A Social Science-based Approach to Explanations for (Game) AI