

Conference Program

**IEEE Conference
on Computational Intelligence and Games**

26 - 29 August 2014

Park Inn Hotel Dortmund, Germany



General Chairs

Günter Rudolph, TU Dortmund University, Germany

Mike Preuss, WWU Münster University, Germany

Program Chairs

Mirjam Eladhari, University of Malta, Malta

Moshe Sipper, Ben-Gurion University of the Negev, Israel

Tutorials/Special Sessions Chair

Philip Hingston, Edith Cowan University, Perth, Australia

Competition Chair

Simon Lucas, University of Essex, UK

Keynote Chair

Gillian Smith, Northeastern University, Boston, USA

Proceedings Chair

Paolo Burelli, Aalborg University, Copenhagen, Denmark

Sponsors



Monday, 25th August 2014

17:00 Pre-registration
– Foyer, Park Inn Hotel
19:30

Note: A red asterisk ★ in front of a paper title indicates a nomination for the best paper award.

Tuesday, 26th August 2014

08:00 Registration

08:20 Opening Session

Session Chairs: Mike Preuß and Günter Rudolph

08:30 Invited Talk

Session Chair: Georgios Yannakakis

Rilla Khaled

What We Talk About When We Talk About Procedural Content Generation

09:30 Break

10:00 Session: **Monte Carlo Tree Search (TU-1)**

Session Chair: Simon Lucas

10:00 *Tobias Graf and Marco Platzner*

Common Fate Graph Patterns in Monte Carlo Tree Search for Computer Go

10:20 *M.J.W. Tak, Marc Lanctot and Mark H. M. Winands*

Monte Carlo Tree Search Variants for Simultaneous Move Games

10:40 *Nick Sephton, Peter Cowling and Edward Powley*

Heuristic Move Pruning in Monte Carlo Tree Search for the Strategic Card Game Lords of War

11:00 *Marc Lanctot, Mark H. M. Winands, Tom Pepels and Nathan R. Sturtevant*

★ Monte Carlo Tree Search with Heuristic Evaluations using Implicit Minimax Backups

11:20 *Nicolas A. Barriga, Marius Stanescu and Michael Buro*

★ Parallel UCT Search on GPUs

11:40 *Niels Justesen, Balint Tillman, Julian Togelius and Sebastian Risi*

Script- and Cluster-based UCT for StarCraft

12:00 Lunch

13:30 Session: **Social Games and Culture (TU-2)**

Session Chair: Dan Ashlock

13:30 *Garrison Greenwood and Phillipa Avery*

Does the Moran Process Hinder Our Understanding of Cooperation in Human Populations?

13:50 *Mateusz Bialas, Shoshannah Tekofsky and Pieter Spronck*

Cultural Influences on Play Style

14:10 *Sam Devlin, Peter I. Cowling, Daniel Kudenko, Nikolaos Goumagias, Alberto Nucciarelli, Ignazio*

Cabras, Kiran Fernandes and Feng Li.

Game Intelligence (Vision Paper)

14:30 Tutorial

Julian Togelius and Georgios N. Yannakakis

A Panorama of Research on CI and AI in Games

16:00 **Public Transportation to Brewery Museum (by foot / subway)**

Directions:

Walk from Park Inn Hotel to subway station *Stadtgarten* (5 min).

Catch subway **U42** in direction *Grevel* or **U46** in direction *Brunnenstraße* (4 min).

Leave subway at station *Brunnenstraße*.

Walk to Brewery Museum located at *Steigerstraße 16* (11 min).

The subway departs approximately every 5 minutes.

A ticket (one way) costs 2.50 €.

17:00 **Start of Reception at Brewery Museum Dortmund**

19:00 **End of Reception**

Wednesday, 27th August 2014

- 09:00 Invited Talk** *Session Chair: Mike Preuß*
Thorsten Quant
The social fabric of virtual life: Social-scientific research on the use and effects of digital games
- 10:00 Break**
- 10:30 Session: Real-Time Strategy Games (WE-1a)** *Session Chair: Ruck Thawonmas*
- 10:30 *Hyun-Tae Kim and Kyung-Joong Kim*
Learning to Recommend Game Contents for Real-Time Strategy Gamers
- 10:50 *Swen Gaudl and Joanna J. Bryson*
Extended Ramp Goal Module: Low-Cost Behaviour Arbitration for Real-Time Controllers based on Biological Models of Dopamine Cells
- 11:10 *Michael Leece and Arnav Jhala*
Opponent State Modeling in RTS games with limited information using Markov Random Fields
- 11:30 *Shaun Bangay and Owen Makin*
Generating an Attribute Space for analyzing Balance in Single Unit RTS Game Combat
- 11:50 *Siming Liu, Sushil Louis and Christopher Ballinger*
Evolving Effective Micro Behaviors in RTS Game
- 12:10 *Christopher Ballinger and Sushil Louis*
Learning Robust Build-Orders from Previous Opponents with Coevolution
- 10:30 Session: General Game Playing and TD-Learning (WE-1b)** *Session Chair: Peter Cowling*
- 10:30 *Diego Perez, Spyridon Samothrakis and Simon Lucas*
★ Knowledge-based Fast Evolutionary MCTS for General Video Game Playing
- 10:50 *Maciej Swiechowski and Jacek Mandziuk*
Prolog versus specialized logic inference engine in General Game Playing
- 11:10 *Chong-U Lim and D. Fox Harrell*
An Approach to General Videogame Evaluation and Automatic Generation using a Description Language
- 11:30 *Markus Thill, Samineh Bagheri, Patrick Koch and Wolfgang Konen*
Temporal Difference Learning with Eligibility Traces for the Game Connect Four
- 11:50 *Tom Vodopivec and Branko Ster*
Enhancing Upper Confidence Bounds for Trees with Temporal Difference Values
- 12:10 *Marcin Szubert and Wojciech Jaskowski*
Temporal Difference Learning of N-Tuple Networks for the Game 2048
- 12:30 Lunch**
[in parallel: 13:00 – 14:00 GTC Meeting]
- 14:00 Session: Theory of Games (WE-2a)** *Session Chair: Garry Greenwood*
- 14:00 *Luciano Gualà, Stefano Leucci and Emanuele Natale*
Bejeweled, Candy Crush and other Match-Three Games are (NP-)Hard
- 14:20 *Wendy Ashlock and Daniel Ashlock*
Shaped Prisoner's Dilemma Automata
- 14:40 *David Lupien St-Pierre and Olivier Teytaud*
The Nash and the Bandit Approaches for Adversarial Portfolios

- 15:00 *Jeffrey Tsang*
Comparing the Structure of Probabilistic 4- and 8-state Finite Transducer Representations for Prisoner's Dilemma
- 15:20 *Jeffrey Tsang*
Applying Fingerprint Multilateration to Population Dynamics in Prisoner's Dilemma Simulations

14:00 Session: Player Experience and Player Modelling (WE-2b) Session Chair: Georgios Yannakakis

- 14:00 *Paolo Burelli, Georgios Triantafyllidis and Ioannis Patras*
Non-invasive Player Experience Estimation from Body Motion and Game Context
- 14:20 *Vanus Vachiratamporn, Koichi Moriyama, Ken-Ichi Fukui and Masayuki Numao*
An Implementation of Affective Adaptation in Survival Horror Games
- 14:40 *Rafet Sifa, Christian Bauckhage and Anders Drachen*
The Playtime Principle: Large-scale Cross-games Interest Modeling
- 15:00 *Christoffer Holmgard, Antonios Liapis, Julian Togelius and Georgios N. Yannakakis*
Evolving Personas for Player Decision Modeling
- 15:20 *Trevor Sarratt, David Pynadath and Arnav Jhala*
Converging to a Player Model in Monte-Carlo Tree Search

15:40 Break

16:10 Session: Game Mining, Player Prediction and Balancing (WE-3a) Session Chair: Anders Drachen

- 16:10 *Fabian Hadji, Rafet Sifa, Anders Drachen, Christian Thureau, Kristian Kersting and Christian Bauckhage*
Predicting Player Churn in Free-to-play Games
- 16:30 *Roman Garnett, Thomas Gaertner, Timothy Ellersiek, Eyjolfur Gudmondsson and Petur Oskarsson*
Predicting Unexpected Influxes of Players in EVE Online
- 16:50 *Julian Runge, Peng Gao, Florent Garcin and Boi Faltings*
★ Churn Prediction for High-value Players in Casual Social Games
- 17:10 *Christian Bauckhage, Rafet Sifa, Anders Drachen, Christian Thureau and Fabian Hadji*
Beyond Heatmaps: Spatio-Temporal Clustering using Behavior-Based Partitioning of Game Levels
- 17:30 *Jonathan Tremblay, Pedro Andrade Torres and Clark Verbrugge*
An Algorithmic Approach to Analyzing Combat and Stealth Games

16:10 Session: Agents and Virtual Characters (WE-3b) Session Chair: Tommy Thompson

- 16:10 *Sylvain Labranche, Nicolas Sola, Sophie Callies and Eric Beaudry*
Using Partial Satisfaction Planning to Automatically Select NPCs' Goals and Generate Plans in a Simulation Game
- 16:30 *Ibrahim Mahmoud, Lianchao Li, Dieter Wloka and Mostafa Ali*
Believable NPCs in Serious Games: HTN Planning Approach Based on Visual Perception
- 16:50 *Spyridon Samothrakis, Samuel Roberts, Diego Perez and Simon Lucas*
Rolling Horizon methods for Games with Continuous States and Actions
- 17:10 *Maxime Sanselone, Stephane Sanchez, Cedric Sanza, David Panzoli and Yves Duthen*
Control of non-playing characters in a medical learning game with Monte Carlo Tree Search
- 17:30 *Joan Marc Llargues Asensio, Juan Peralta Donate and Paulo Cortez*
Evolving Artificial Neural Networks Applied to Generate Virtual Characters

Thursday, 28th August 2014

- 08:30 Invited Talk** *Session Chair: Daniele Loiacono*
Jochen Peketz
Human Computer Game Interaction
- 09:30 Break**
- 10:00 Session: Automated Design and Design Tools (TH-1)** *Session Chair: Jose-Maria Peña*
- 10:00 *Scott Watson, Wolfgang Banzhaf and Andrew Vardy*
Automated Design for Playability in Computer Game Agents
- 10:20 *Antonios Liapis, Georgios Yannakakis and Julian Togelius*
★ Designer Modeling for Sentient Sketchbook
- 10:40 *Mike Preuss, Antonios Liapis and Julian Togelius*
★ Searching for Good and Diverse Game Levels
- 11:00 *Pier Luca Lanzi, Daniele Loiacono and Riccardo Stucchi*
Evolving Maps for Match Balancing in First Person Shooters
- 11:20 *Jiao Jian Wang and Olana Missura*
Racing Tracks Improvisation
- 11:40 *Daniel Scales and Tommy Thompson*
SpelunkBots API - An AI Toolset for Spelunky
- 12:00 Lunch**
- 13:30 Tutorial**
Garrison Greenwood
Introduction to Evolutionary Game Theory
- 15:00 Break**
- 15:30 Demo Session**
- Phil Lopes, Antonios Liapis and Georgios Yannakakis*
The C²Create Authoring Tool: Fostering Creativity via Game Asset Creation
- Sheng-Yi Hsu, Julian Togelius and Chung-Tsai Sun*
Towards market seller modeling in World of Warcraft
- In-Seok Oh, Ho-Chul Cho and Kyung-Joong Kim*
Imitation Learning for Combat System in RTS Games with Application to StarCraft
- Philip Rodgers and John Levine*
An Investigation into 2048 AI Strategies
- Hyunsoo Park and Kyung-Joong Kim*
Learning to Play Fighting Game using Massive Play Data
- Gabriella Barros and Julian Togelius*
Exploring a Large Space of Small Games
- Hyun-Tae Kim, Du-Mim Yoon and Kyung-Joong Kim*
Solving Geometry Friends using Monte-Carlo Tree Search with Directed Graph Representation
- Jan Quadflieg*
Improvements for the Simulated Car Racing Software Interface
- William Cachia, Luke Aquilina, Hector P. Martinez and Georgios Yannakakis*
Procedural Generation of Music-Guided Weapons

16:50 Session: Physics-Based Games 1 (TH-2)

Session Chair: Paolo Burelli

- 16:50 *Luca Galli, Pier Luca Lanzi and Daniele Loiacono*
Applying Data Mining to Extract Design Patterns from Unreal Tournament Levels
- 17:10 *Stefan Edelkamp and Erion Plaku*
Multi-Goal Motion Planning with Physics-based Game Engines

17:30 Public Transportation to Dortmund's Canal Harbor (by foot / subway)

Directions:

Walk from Park Inn Hotel to subway station *Stadtgarten* (5 min).

Catch subway **U47** in *direction Westerfild*, leave subway at station *Hafen* (7 min).

The quay with our ship named *Monika 1* is in sight and only few steps away.

The subway departs every 10 minutes: 17:40 / 17:50 / 18:00 etc.

A ticket (one way) costs 2.50 €.

The last subway from *Hafen* to the City Center is at 00:16.

In the evening the subway departs every 15 minutes.

19:00 Dinner Cruise begins ...

... including:

- Best Paper Award
- Student Travel Grants

Friday, 29th August 2014

09:00 Invited Talk

Mark Riedl

Artificial Intelligence for Interactive Narrative

Session Chair: Julian Togelius

10:00 Break

10:30 Session: Procedural Content Generation and Board Games (FR-1)

Session Chair: Pieter Spronck

10:30 *Jose-Maria Pena, Javier Viedma Ortiz-Canavate, Santiago Muelas, Antonio Latorre and Luis Pena*
Designer-driven 3D Buildings Generated Using Variable Neighborhood Search

10:50 *Lucas Ferreira and Claudio Toledo*
A Search-based Approach for Generating Angry Birds Levels

11:10 *Steve Dahlskog and Julian Togelius*
A Multi-level Level Generator

11:30 *Daniel Ashlock and Cameron Mcguinness*
Automatic Generation of Fantasy Role-playing Modules

11:50 *Markus Guhe and Alex Lascarides*
The Effectiveness of Persuasion in The Settlers of Catan

12:10 *Markus Guhe and Alex Lascarides*
Game strategies for The Settlers of Catan

12:30 Lunch

14:00 Session: Physics-Based Games 2 (FR-2)

Session Chair: Wolfgang Konen

14:00 *Stefan Edelkamp and Christoph Greulich*

Solving Physical Traveling Salesman Problems with Policy Adaptation

14:20 *Jayden Ivanovic, Fabio Zambetta, Xiaodong Li and Jessica Rivera Villicana*

Reinforcement Learning to Control a Commander for Capture The Flag

14:40 Competition Paper

Syunsuke Mizuno, Yamamoto Kaito, Chun Chu and Ruck Thawonmas.

Deduction of Fighting-Game Countermeasures Using the k-Nearest Neighbor Algorithm and a Game Simulator

15:00 Break

15:30 Competition Session

Session Chair: Phil Hingston

15:30 *Ruck Thawonmas*

Fighting Game Competition Results

15:45 *Kyung-Joong Kim*

Starcraft AI Results

16:00 *Diego Perez*

General Video Game AI: Results

16:15 *Raul Arrabales*

Human-Like Bot Competition Results

16:30 *Rui Prada*

Geometry Friends: Results

16:45 *Phil Hingston*

Student Video Competition

17:00 Competition Awards Ceremony

Session Chair: Frank Wiesenfeller

Awards donated by Alumni Association of Computer Science Dortmund e. V.

17:10 Closing Session

- Conference Wrap-up
- Presentation of IEEE CIG 2015 (Taiwan)
- Farewell