

About GEIST

Our Research

See our



- [People](#)

- [Profile](#)

- [News](#)

- [Projects](#)

- [Contact](#)

- [Development](#)

- [Teaching](#)

- [Publications](#)

- [Software](#)

- **13 Mar 2023 - [AIRA seminar] Bartosz Zieliński** We kindly invite you to the next seminar in the [AIRA series](#). Bartosz Zieliński, Associate Professor @ Jagiellonian University will give a talk entitled **Interpretable Deep Learning with Prototypical Parts** will start on **Thursday (16.03.2023) at 15:30!**

See <https://aira.geist.re/> for more details (meeting link, abstract, biogram, full schedule).

GEIST news



- **20 Feb 2023 - [AIRA seminar] Antonio Martinez-Sanchez**, We kindly invite you to the next seminar in the [AIRA series](#). Antonio Martinez-Sanchez, Tenure-track Professor @ University of Murcia, Spain will give a talk entitled **Computational methods for Cryo-Electron Tomography: current challenges** will start on **Thursday (02.03.2023) at 15:30!**

See <https://aira.geist.re/> for more details (meeting link, abstract, biogram, full schedule).



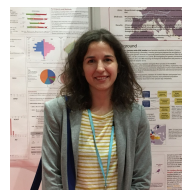
- **19 Jan 2023 - [AIRA seminar] Stella Heras** We kindly invite you to the next seminar in the [AIRA series](#). Stella Heras, Assistant Professor @ Universitat Politècnica de València (UPV) Spain will give a talk entitled **Automatic Analysis of Argumentative Discourse and Argumentation-based Human Persuasion** will start on **Thursday (26.01.2023) at 15:30!**

See <https://aira.geist.re/> for more details (meeting link, abstract, biogram, full schedule).



- **16 Jan 2023 - [AIRA seminar] Bartosz Soból** We kindly invite you to the

next seminar in the [AIRA series](https://geist.re/pub:news?rev=1678708596). Bartosz Soból, PhD Candidate @ Jagiellonian University will give a talk entitled **Hypernetwork approach to few-shot learning** will start on **Thursday (19.01.2023) at 15:30!** See <https://aira.geist.re/> for more details (meeting link, abstract, biogram, full schedule).



- **04 Jan 2023 - [AIRA seminar] Candela Hernández** We kindly invite you to the next seminar in the [AIRA series](https://geist.re/pub:news?rev=1678708596). Candela Hernández, Assistant Professor @ Complutense University will give a talk entitled **Machine learning applications in Biological Anthropology** will start on **Thursday (12.01.2023) at 15:30!** See <https://aira.geist.re/> for more details (meeting link, abstract, biogram, full schedule).



- **12 Dec 2022 - [AIRA seminar] Przemysław Spurek** We kindly invite you to the next seminar in the [AIRA series](https://geist.re/pub:news?rev=1678708596). Przemysław Spurek, Assistant Professor @ Jagiellonian University will give a talk entitled **Hypernetwork approach to few-shot learning** will start on **Thursday (15.12.2022) at 15:30!** See <https://aira.geist.re/> for more details (meeting link, abstract, biogram, full schedule).



- **05 Dec 2022 - [AIRA seminar] Roman Sosnowski, Piotr Tylus, Jadwiga Kita-Huber, Remigiusz Sapa, Grzegorz J. Nalepa, Krzysztof Kutt** We kindly invite you to the next seminar in the [AIRA series](https://geist.re/pub:news?rev=1678708596). Roman Sosnowski, Piotr Tylus, Jadwiga Kita-Huber, Remigiusz Sapa, Grzegorz J. Nalepa, and Krzysztof Kutt will give a talk entitled **Digitalization of library handwriting resources and opportunities for Artificial Intelligence. The case of Autographa Sammlung in the Jagiellonian Library** will start on **Thursday (08.12.2022) at 15:30!**

See <https://aira.geist.re/> for more details (meeting link, abstract, biogram, full schedule).



- **25 Nov 2022 - [AIRA seminar] Marcin Tutajewski** We kindly invite you to the next seminar in the [AIRA series](https://aira.geist.re/). Marcin Tutajewski, PhD Candidate @ Jagiellonian University will give a talk entitled **Detection of multiple sclerosis from EEG signals using machine learning methods** will start on **Thursday (01.12.2022) at 15:30!**
See <https://aira.geist.re/> for more details (meeting link, abstract, biogram, full schedule).



- **18 Nov 2022 - [AIRA seminar] Bartłomiej Małkus** We kindly invite you to the next seminar in the [AIRA series](https://aira.geist.re/). Bartłomiej Małkus, PhD Candidate @ Jagiellonian University will give a talk entitled **Physics guided neural networks with application to financial modeling** will start on **Thursday (24.11.2022) at 15:30!**
See <https://aira.geist.re/> for more details (meeting link, abstract, biogram, full schedule).



- **10 Nov 2022 - [AIRA seminar] dr Jarosław Duda** We kindly invite you to the next seminar in the [AIRA series](https://aira.geist.re/). Jarosław Duda, Assistant Professor @ Jagiellonian University will give a talk entitled **Hierarchical correlation reconstruction - between statistics and machine learning** will start on **Thursday (17.11.2022) at 15:30!**
See <https://aira.geist.re/> for more details (meeting link, abstract, biogram, full schedule).



- **10 Nov 2022 - [AIRA seminar] Paweł Matyszok** We kindly invite you to the next seminar in the [AIRA series](#). Paweł Matyszok, PhD Candidate @ Silesian University of Technology will give a talk entitled **Action Rules induction by Sequential Covering** will start on **Thursday (10.11.2022) at 15:30!**

See <https://aira.geist.re/> for more details (meeting link, abstract, biogram, full schedule).



- **21 Oct 2022 - [AIRA seminar] Jerzy Stefanowski** We kindly invite you to the next seminar in the [AIRA series](#). prof. dr hab. inż. Jerzy Stefanowski, Poznan University of Technology will give a talk entitled **Learning classifiers from concept drifting and imbalanced data streams** will start on **Thursday (27.10.2022) at 15:30!**

See <https://aira.geist.re/> for more details (meeting link, abstract, biogram, full schedule).



- **18 Oct 2022 - 150th anniversary of the PAU.** A three-day international scientific conference to celebrate the 150th anniversary of the [Polish Academy of Arts and Sciences \(PAU\)](#) begins today. Of [all the intriguing sessions](#), we especially invite you to the “Real and Virtual Reality, Artificial Intelligence” taking place on Thursday, where [Grzegorz J. Nalepa](#) will give a talk entitled **“Can Natural Intelligence Understand Artificial Intelligence?”**.



- **17 Oct 2022 - [AIRA seminar] Maciej Mozolewski** We kindly invite you to the next seminar in the [AIRA series](#). Maciej Mozolewski, PhD Candidate @ Jagiellonian University will give a talk entitled **Artificial intelligence for support business processes** will start on **Thursday (20.10.2022) at 15:30!**

See <https://aira.geist.re/> for more details (meeting link, abstract, biogram, full schedule).

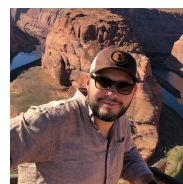
- **20 September 2022 - Next paper published by Nature!** Our next paper was published by Nature. Now, it is a report on perception of time in

virtual reality published in Nature Scientific Reports (10.1038/s41598-022-18520-1; IF 4.996). Take a look at the paper and do not hesitate to contact us if you like it!

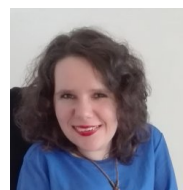
- **07 June 2022 - GEIST in Wrocław!** Grzegorz J. Nalepa, Szymon Bobek and Krzysztof Kutt will highlight our key projects and results at the “Collective Intelligence in Information Systems” seminar in Wrocław, PL. The talk, entitled **Perspectives on Applications of Intelligent Systems in Humanized AI. Recent projects of the GEIST team**, will begin at 09:00 Friday (10.06.2022) and you are invited!
- **07 June 2022 - BIRAFFE2 Data Descriptor in Sci Data!** Data Descriptor for our BIRAFFE2 dataset was published in Nature Scientific Data (10.1038/s41597-022-01402-6; IF 6.444). Take a look at the paper and do not hesitate to use our dataset in your research!



- **23 May 2022 - [AIRA seminar] dr hab. inż. Marcin Hernes, & dr inż. Krzysztof Lutosławski & Agata Kozina** We kindly invite you to the next seminar in the AIRA series. dr hab. inż. Marcin Hernes, prof. UEW & dr inż. Krzysztof Lutosławski assistant professor @ UEW & Agata Kozina, Ph.D. candidate @ UEW will give a talk entitled **Artificial intelligence for support business processes** will start on **Thursday (26.05.2022) at 15:30!** See <https://aira.geist.re/> for more details (meeting link, abstract, biogram, full schedule).



- **13 May 2022 - [AIRA seminar] dr hab. Mateusz Hohol** We kindly invite you to the next seminar in the AIRA series. dr hab. Mateusz Hohol, prof. @ Jagiellonian University will give a talk entitled **Investigating and facilitating human geometric cognition through VR/AR technologies** will start on **Thursday (19.05.2022) at 15:30!** See <https://aira.geist.re/> for more details (meeting link, abstract, biogram, full schedule).



- **30 April 2022 - [AIRA seminar] Magdalena Wiercioch** We kindly invite you to the next seminar in the AIRA series. Magdalena Wiercioch, PhD

Candidate @ UJ will give a talk entitled **Machine Learning in Drug Discovery: Applications and Techniques** will start on **Thursday (05.05.2022) at 15:30!**

See <https://aira.geist.re/> for more details (meeting link, abstract, biogram, full schedule).



- **11 April 2022 - [AIRA seminar] Maciej Szelązek** We kindly invite you to the next seminar in the [AIRA series](https://aira.geist.re/). Maciej Szelązek, PhD Candidate @ AGH UST will give a talk entitled **Semantic Data Mining Based Decision Support for Quality Assessment in Steel Industry** will start on **Thursday (14.04.2022) at 15:30!**

See <https://aira.geist.re/> for more details (meeting link, abstract, biogram, full schedule).



- **04 April 2022 - [AIRA seminar] Przemysław Kazienko & Jan Kocoń** We kindly invite you to the next seminar in the [AIRA series](https://aira.geist.re/). Przemysław Kazienko, Full Professor @ Wrocław University of Science and Technology and Jan Kocoń, Assistant Professor @ Wrocław University of Science and Technology will give a talk entitled **Personalized NLP** will start on **Thursday (07.04.2022) at 15:30!**

See <https://aira.geist.re/> for more details (meeting link, abstract, biogram, full schedule).



- **25 March 2022 - [AIRA seminar] Bartłomiej Nawara** We kindly invite you to the next seminar in the [AIRA series](https://aira.geist.re/). Bartłomiej Nawara, PhD Candidate @ Jagiellonian University will give a talk entitled **On open problems of theory of knowledge, based on Luciano Floridi's theory of semantic information** will start on **Thursday (31.03.2022) at 15:30!**

See <https://aira.geist.re/> for more details (meeting link, abstract, biogram, full schedule).



- **18 March 2022 - [AIRA seminar] dr Michał Araszkiewicz** We kindly invite you to the next seminar in the [AIRA series](https://aira.geist.re/). Dr Michał Araszkiewicz, Assistant Professor @ Jagiellonian University will give a talk entitled **Artificial Intelligence and (Human Rights) Law** will start on **Thursday (24.03.2022) at 15:30!**

See <https://aira.geist.re/> for more details (meeting link, abstract, biogram, full schedule).



- **11 March 2022 - [AIRA seminar] Radosław Pałosz** We kindly invite you to the next seminar in the [AIRA series](https://aira.geist.re/). Radosław Pałosz, PhD Candidate @ UJ will give a talk entitled **Explaining the Artificial Intelligence Act** will start on **Thursday (17.03.2022) at 15:30!**

See <https://aira.geist.re/> for more details (meeting link, abstract, biogram, full schedule).



- **10 March 2022 - [AIRA seminar] Maciej Mozolewski** We kindly invite you to the next seminar in the [AIRA series](https://aira.geist.re/). Maciej Mozolewski, PhD Candidate @ UJ will give a talk entitled **Demonstration of InXAI framework on ensemble classifier ML model** will start on **Thursday (10.03.2022) at 15:30!**

See <https://aira.geist.re/> for more details (meeting link, abstract, biogram, full schedule).



- **25 February 2022 - [AIRA seminar] Michał Kuk** We kindly invite you to the next seminar in the [AIRA series](https://aira.geist.re/). Michał Kuk, PhD Candidate @ AGH UST will give a talk entitled **Enhancing cluster analysis with explainable AI and multidimensional cluster prototypes** will start on **Thursday (03.03.2022) at 15:30!**

See <https://aira.geist.re/> for more details (meeting link, abstract, biogram,

full schedule).



- **27 January 2022 - [AIRA seminar] Victor Rodriguez-Fernandez** We kindly invite you to the next seminar in the [AIRA series](#). Victor Rodriguez-Fernandez, assistant Professor at the Universidad Politécnica de Madrid will give a talk entitled **Modern deep learning approaches for time series** will start on **Thursday (27.01.2022) at 15:30!** See <https://aira.geist.re/> for more details (meeting link, abstract, biogram, full schedule).



- **20 January 2022 - [AIRA seminar] Jakub Jakubowski** We kindly invite you to the next seminar in the [AIRA series](#). Jakub Jakubowski, Ph.D. candidate at the AGH UST will give a talk entitled **Explainable anomaly detection in hot-rolling process** will start on **Thursday (20.01.2022) at 15:30!** See <https://aira.geist.re/> for more details (meeting link, abstract, biogram, full schedule).



- **13 January 2022 - [AIRA seminar] Szymon Bobek** We kindly invite you to the next seminar in the [AIRA series](#). Szymon Bobek, assistant Professor at the Jagiellonian University will give a talk entitled **Challenges in Explainable Artificial Intelligence for Industry 4.0** will start on **Thursday (13.02.2022) at 15:30!** See <https://aira.geist.re/> for more details (meeting link, abstract, biogram, full schedule).

- **31 December 2021 - Two papers for the end of the 2021!** Our efforts in 2021 resulted in two papers published at the end of the year! We encourage you to read them and contact with us for more information. First one deals with the **Immersive Parallel Coordinates Plots (IPCP) system for Virtual Reality (VR)** (DOI: [10.3390/app12010331](https://doi.org/10.3390/app12010331); published on 30th December in MDPI Applied Sciences; **IF 2.679**). The second one presents **our solution for predictive maintenance (PdM)** (DOI: [10.3390/s22010291](https://doi.org/10.3390/s22010291); published on 31st December in MDPI Sensors; **IF 3.576**)



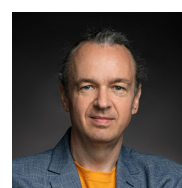
- **10 December 2021 - [AIRA seminar] Timos Kipouros.** We kindly invite you to the next seminar in the [AIRA series](https://aira.geist.re/). Timos Kipouros, a Senior Research Associate at the University of Cambridge will summarise some of the research threads being developed in the Engineering Design Centre at the University of Cambridge. His talk entitled **Visual Analytics for Aerospace and Healthcare Systems Design** will start on **Thursday (16.12.2021) at 15:30!**

See <https://aira.geist.re/> for more details (meeting link, abstract, biogram, full schedule).



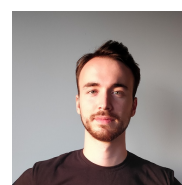
- **3 December 2021 - [AIRA seminar] Bartosz Soból.** We kindly invite you to the next seminar in the [AIRA series](https://aira.geist.re/). Bartosz Soból, a PhD Candidate at Jagiellonian University will present his research interests in a talk entitled **Recent developments of machine learning in experimental particle physics**. We start on **Thursday (09.12.2021) at 15:30!**

See <https://aira.geist.re/> for more details (meeting link, abstract, biogram, full schedule).



- **26 November 2021 - [AIRA seminar] Grzegorz J. Nalepa.** We kindly invite you to the next seminar in the [AIRA series](https://aira.geist.re/). Professor [Grzegorz J. Nalepa](#) will summarise our research done in the area of Industry 4.0 in a talk entitled **Artificial Intelligence in Industry 4.0: Data, Models, and Knowledge**. We start on **Thursday (02.12.2021) at 15:30!**

See <https://aira.geist.re/> for more details (meeting link, abstract, biogram, full schedule).



- **19 November 2021 - [AIRA seminar] Marcin Tutajewski.** We kindly invite you to the next seminar in the [AIRA series](#). Marcin Tutajewski, a PhD Candidate at Jagiellonian University will present his research related to fMRI data analysis in a talk entitled **Classification of ROI-based fMRI data in short-term memory tasks using discriminant analysis and neural networks**. We start on **Thursday (25.11.2021) at 15:30!**

See <https://aira.geist.re/> for more details (meeting link, abstract, biogram, full schedule).



- **15 November 2021 - [AIRA seminar] Krzysztof Kutt: AI with psychology - a few words on affective adaptation and personalisation of intelligent systems.** The next seminar in the [AIRA series](#) will be devoted to the use of psychological methodology (in particular emotion research) in the development of intelligent systems. [Krzysztof Kutt](#) will highlight the key findings of research conducted in this area by the [AfCAI team](#). As always, we start on **Thursday (18.11.2021) at 15:30**. You are welcome!

See <https://aira.geist.re/> for more details (meeting link, abstract, biogram, full schedule).



- **1 November 2021 - [AIRA seminar] Andrzej Grabowski: Telepresence and simulators - modern use of Virtual Reality in robotics and training with possible application of AI.** We invite you to the third seminar in the [AIRA series](#). Andrzej Grabowski, head of Virtual Reality Laboratory in Department of Safety Engineering of Central Institute for Labour Protection – National Research Institute, will show three different VR applications and discuss the possibilities of improving training simulations by using AI to modify the course of the training scenario in real-time. We start on **4 November at 15:30**.

See <https://aira.geist.re/> for more details (meeting link, abstract, biogram, full schedule).



- **25 October 2021 - [AIRA seminar] Marcin Woźniak: Smart environment - AI meets IoT.** The second seminar in the [AIRA series](#) will begin **this Thursday (28.10.2021) at 15:30**. Marcin Woźniak, PhD, a

Professor at Silesian University of Technology, will talk about IoT and AI-based solutions for smart environments. He will show and discuss latest advances and ideas in model of data processing and automatic control of processes and devices used in these environments.

See <https://aira.geist.re/> for more details (meeting link, abstract, biogram, full schedule).



- **18 October 2021 - [AIRA seminar] Bartłomiej Małkus: Financial modeling with applications of machine learning and explainable AI.**

We invite you to the first seminar in the [AIRA series](#). Bartłomiej Małkus, a PhD candidate at the Jagiellonian University in Technical Computer Science, will talk about financial modelling, including financial instruments pricing, risk modeling and financial data sources that may be used for research purposes. We start on **21 October at 15:30**.

See <https://aira.geist.re/> for more details (meeting link, abstract, biogram, full schedule).

- **10 October 2021 - AIRA seminar!** GEIST is happy to announce, that we are launching an **open, online seminar on Artificial Intelligence in Research and Applications (AIRA)**. It will be a weekly event with various guests from many different AI-related research fields as well as industry and business areas. Please save your Thursdays between 3:30-5:00 PM Warsaw Time. The program will be published at <https://aira.geist.re>

- **24 June 2021 - Paper in the Sensors: 20th Anniversary special issue!** We have published one more paper in MDPI Sensors (**IF 3.576**)! We encourage you to read our review on **Semantic Data Mining in Ubiquitous Sensing** – available in open access under DOI: [10.3390/s21134322](https://doi.org/10.3390/s21134322).

- **14 June 2021 - ICCS 2021 in Kraków (online).** This week we invite you to the [ICCS 2021](#) conference taking place remotely in Krakow, PL to listen to our five papers ([A Voice-based Travel Recommendation System Using Linked Open Data](#), [Introducing Uncertainty Into Explainable AI Methods](#), [Towards Model-Agnostic Ensemble Explanations](#), [Augmenting automatic clustering with expert knowledge and explanations](#), [Explanation-driven model stacking](#)) and many other interesting contributions!

- **14 June 2021 - Two papers were published** as proceedings of [IEEE DSAA 2021 Conference](#). [Explainable anomaly detection for Hot-rolling industrial process](#) from XPM project (eXplainable Predictive Maintenance; CHIST-ERA-19-XAI-012) and [Explainable clustering with multidimensional bounding boxes](#) from CHIST-ERA PACMEL project.



- **30 April 2021 - Special Session on XPdM 2021.** We would like to invite you to submit articles for the special session on Data-Driven Predictive Maintenance for Industry 4.0 (XPdM 2021) to be held on October 6-9, 2021, Porto-Portugal (Online), co-located with [IEEE DSAA 2021](#). It is co-organised by [Grzegorz J. Nalepa](#) and linked to our XPM project (eXplainable Predictive Maintenance; CHIST-ERA-19-XAI-012). Call for papers and more information are provided at: <https://sites.google.com/g.uporto.pt/ddpdm2021/>.

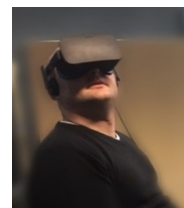


- **17 April 2021 - Summer School on Data-Driven Predictive Maintenance for Industry 4.0.** A summer school sponsored by the international XPM project (eXplainable Predictive Maintenance; CHIST-ERA-19-XAI-012), in which the Polish team is led by [Grzegorz J. Nalepa](#), will be held online on **October 3-5, 2021**. You are cordially invited! The Summer School is for students, researchers, and practitioners who want to **learn how to implement predictive maintenance to solve real industrial problems using machine learning approaches**. More information at: <https://hh.se/PMSummerSchool>.
- **4 March 2021 - PRAXAI special session at DSAA.** We invite you to take part in a special session "Practical applications of explainable artificial intelligence methods (PRAXAI)" at [The 8th IEEE International Conference on Data Science and Advanced Analytics](#). It is related to the CHIST-ERA PACMEL project coordinated by [Grzegorz J. Nalepa](#). For more details and call for papers, see <http://praxai.geist.re>.
- **4 January 2021 - PANBA Minigrant.** [Krzysztof Kutt](#) received a research minigrant in the [DigiWorld Priority Research Area UJ](#). The project named "Personality, Affective Context and the Brain (PANBA)" is aimed at analyzing data from the [BIRAFFE2 experiment](#) and preparing a new research procedure that includes the use of EEG.
- **30 December 2020 - Two papers in MDPI's journals!** Recently, we have published papers on the ongoing research in the [PACMEL project](#) and the [BIRAFFE study](#). The former can be seen in MDPI Energies ([10.3390/en13246630](#); **IF 2.702**) and the latter in MDPI Sensors

([10.3390/s21010163](#); **IF 3.275**). We hope you will enjoy them! And don't hesitate to ask if you have questions!



- **1 December 2020 - Another success in the CHIST-ERA Call!** The previous project is still ongoing (**PACMEL**, CHIST-ERA Call 2017), but [Grzegorz J. Nalepa](#) get another grant! **XPM: eXplainable Predictive Maintenance** is among awarded projects in CHIST-ERA Call 2019. The project involves researchers from Poland, France, Portugal and Sweden. See the [NCN announcement](#).
- **28 August 2020 - Our three papers will be presented during workshops @ECAI 2020!** Let's talk about Framework for Affective Games' Experiments [@MRC](#) and our [BIRAFFE2](#) dataset [@HAI](#). We will also present some recent results from [PACMEL](#) grant during [KR4L](#). [ECAI conference is fully online this year](#), so it is easier to join many fascinating events - let's meet there together!
- **10 October 2019 - Invited talks at EDC, Cambridge!** We were invited to give talks at a seminar in [Engineering Design Centre, Cambridge](#). The presentations entitled **Can a machine understand how you feel by watching you?** (by Krzysztof Kutt, Szymon Bobek and [Grzegorz J. Nalepa](#)) and **Affective Patterns in (Serious) Game Design** (by Jan K. Argasiński and [Grzegorz J. Nalepa](#)) will take place on October 23, 2019.
- **24 September 2019 - BIRAFFE dataset (Bio-Reactions and Faces for Emotion-based Personalization)** with ECG and GSR signals, facial expressions, personality traits and more, collected by us in the spring 2019, is now available under the [CC BY-NC-ND 4.0](#) licence at [Zenodo](#)! 



- **3 June 2019 - A guest from Cambridge!** This week Sławomir Tadeja, a guest from [University of Cambridge](#), is visiting us. We will work hard together on our common research topics. He will also give a speech on *Immersive Visual Analytics* at a seminar at AGH-UST - we invite you on Wednesday 9:35 to room C2 429!
- **31 May 2019 - Paper in Sensors!** Our paper on the [Analysis and Use of the Emotional Context with Wearable Devices for Games and Intelligent Assistants](#) was published in Sensors [**IF 2.475**]. Feel free to read and comment with us!

- **18 May 2019 - Finish of the spring experiment!** Yesterday, we finished current session of affective experiments. **More than 200 people** took part in the 1.5h study with pictures, sounds, games, paper and gamepad. Thank you all for your help! Now we will look closely at the data. We promise to create great articles describing our results. Stay tuned!
- **26 March 2019 - Affective experiment in GEIST!** We are starting the big affective experiment to further develop our ideas on wearable devices, affective computing and affective games. If you are interested in helping us as a participant, take a look at <http://krzysztof.kutt.pl/badania2019> (in polish).

Archive

- [Read more...](#)

From:

<https://geist.re/> - **GEIST Research Group**

Permanent link:

<https://geist.re/pub:news?rev=1678708596>

Last update: **2023/03/13 11:56**

