

Záznamy vložené do ASEP za UI (1.-31.10. 2022)

New ICS records in ASEP (1.-31.10. 2022)

0562624 - ÚI 2023 RIV GB eng J - Journal Article

[Kathpalia, Aditi](#) - [Manshour, Pouya](#) - [Paluř, Milan](#)

Compression complexity with ordinal patterns for robust causal inference in irregularly sampled time series.

Scientific Reports. Roč. 12, č. 1 (2022), č. článku 14170. ISSN 2045-2322. E-ISSN 2045-2322

R&D Projects: GA ČR(CZ) GA19-16066S

Institutional support: RVO:67985807

Impact factor: 4.996, year: 2021

Method of publishing: Open access

<https://dx.doi.org/10.1038/s41598-022-18288-4>

[DOI: 10.1038/s41598-022-18288-4](https://doi.org/10.1038/s41598-022-18288-4)

Distinguishing cause from effect is a scientific challenge resisting solutions from mathematics, statistics, information theory and computer science. Compression-Complexity Causality (CCC) is a recently proposed interventional measure of causality, inspired by Wiener-Granger's idea. It estimates causality based on change in dynamical compression-complexity (or compressibility) of the effect variable, given the cause variable. CCC works with minimal assumptions on given data and is robust to irregular-sampling, missing-data and finite-length effects. However, it only works for one-dimensional time series. We propose an ordinal pattern symbolization scheme to encode multidimensional patterns into one-dimensional symbolic sequences, and thus introduce the Permutation CCC (PCCC). We demonstrate that PCCC retains all advantages of the original CCC and can be applied to data from multidimensional systems with potentially unobserved variables which can be reconstructed using the embedding theorem. PCCC is tested on numerical simulations and applied to paleoclimate data characterized by irregular and uncertain sampling and limited numbers of samples.

Permanent Link: <https://hdl.handle.net/11104/0334897>

0562627 - ÚI 2023 RIV US eng J - Journal Article

[Bartoř, Frantiřek](#) - [Maier, M.](#) - [Quintana, D. S.](#) - [Wagenmakers, J. E.](#) ... Total 5 authors

Adjusting for Publication Bias in JASP and R: Selection Models, PET-PEESE, and Robust Bayesian Meta-Analysis.

Advances in Methods and Practices in Psychological Science. Roč. 5, č. 3 (2022), s. 1-19. ISSN 2515-2459

Institutional support: RVO:67985807

Keywords : selection models * PET-PEESE * robust Bayesian meta-analysis * model averaging * publication bias

OECD category: Statistics and probability

Impact factor: 15.817, year: 2021

Method of publishing: Open access

<https://dx.doi.org/10.1177/25152459221109259>

[DOI: 10.1177/25152459221109259](https://doi.org/10.1177/25152459221109259)

Meta-analyses are essential for cumulative science, but their validity can be compromised by publication bias. To mitigate the impact of publication bias, one may apply publication-bias-adjustment techniques such as precision-effect test and precision-effect estimate with standard errors (PET-PEESE) and selection models. These methods, implemented in JASP and R, allow researchers

without programming experience to conduct state-of-the-art publication-bias-adjusted meta-analysis. In this tutorial, we demonstrate how to conduct a publication-bias-adjusted meta-analysis in JASP and R and interpret the results. First, we explain two frequentist bias-correction methods: PET-PEESE and selection models. Second, we introduce robust Bayesian meta-analysis, a Bayesian approach that simultaneously considers both PET-PEESE and selection models. We illustrate the methodology on an example data set, provide an instructional video (<https://bit.ly/pubbias>) and an R-markdown script (<https://osf.io/uhaew/>), and discuss the interpretation of the results. Finally, we include concrete guidance on reporting the meta-analytic results in an academic article.

Permanent Link: <https://hdl.handle.net/11104/0334899>

Research data: [CRAN \(RoBMA\)](#), [CRAN \(Weightr\)](#)

0562359 - ÚI 2023 RIV CH eng J - Journal Article

Vážná, A. - Vignerová, J. - [Brabec, Marek](#) - Novák, J. - Procházka, B. - Gabera, A. - Sedlák, P.

Influence of COVID-19-Related Restrictions on the Prevalence of Overweight and Obese Czech Children.

International Journal of Environmental Research and Public Health. Roč. 19, September 2022 (2022), č. článku 11902. ISSN 1661-7827. E-ISSN 1660-4601

Institutional support: RVO:67985807

Keywords : COVID-19 * children * obesity * severe obesity * COVID-19-related-restrictions effect * GAM * semiparametric statistical modeling

OECD category: Statistics and probability

Impact factor: 4.614, year: 2021

Method of publishing: Open access

DOI: [10.3390/ijerph191911902](https://doi.org/10.3390/ijerph191911902)

Apart from influencing the health of the worldwide population, the COVID-19 pandemic changed the day-to-day life of all, including children. A sedentary lifestyle along with the transformation of eating and sleep habits took place in the child population. These changes created a highly obesogenic environment. Our aim was to evaluate the current weight in the child population and identify the real effects of the pandemic. Height and weight data were collected by pediatricians from the pre-COVID-19 and post-COVID-19 periods from 3517 children (1759 boys and 1758 girls) aged 4.71 to 17.33 years. We found a significant rise in the z-score BMI between pediatric visits in the years 2019 and 2021 in both sexes aged 7, 9, 11, and 13 years. Especially alarming were the percentages of (severely) obese boys at the ages of 9 and 11 years, which exceed even the percentages of overweight boys. With the use of statistical modeling, we registered the most dramatic increment at around 12 years of age in both sexes. Based on our research in the Czech Republic, we can confirm the predictions that were given at the beginning of the pandemic that COVID-19-related restrictions worsened the already present problem of obesity and excess weight in children.

Permanent Link: <https://hdl.handle.net/11104/0334703>

0562371 - ÚI 2023 RIV US eng C - Conference Paper (international conference)

[Kalina, Jan](#) - [Tumpach, Jiří](#) - [Holeňa, Martin](#)

On Combining Robustness and Regularization in Training Multilayer Perceptrons over Small Data. *2022 International Joint Conference on Neural Networks (IJCNN) Proceedings*. Piscataway: IEEE, 2022. ISBN 978-1-7281-8671-9.

[IJCNN 2022: International Joint Conference on Neural Networks /35./, Padua (IT), 18.07.2022-23.07.2022]

R&D Projects: GA ČR(CZ) GA22-02067S

Institutional support: RVO:67985807

Keywords : feedforward networks * nonlinear regression * outliers * robust neural networks * trend estimation

OECD category: Computer sciences, information science, bioinformatics (hardware development to be 2.2, social aspect to be 5.8)

<https://dx.doi.org/10.1109/IJCNN55064.2022.9892838>

[DOI: 10.1109/IJCNN55064.2022.9892510](https://doi.org/10.1109/IJCNN55064.2022.9892510)

Multilayer perceptrons (MLPs) continue to be commonly used for nonlinear regression modeling in numerous applications. Available robust approaches to training MLPs, which allow to yield reliable results also for data contaminated by outliers, have not much penetrated to real applications so far. Besides, there remains a lack of systematic comparisons of the performance of robust MLPs, if their training uses one of regularization techniques, which are available for standard MLPs to prevent overfitting. This paper is interested in comparing the performance of MLPs trained with various combinations of robust loss functions and regularization types on small datasets. The experiments start with MLPs trained on individual datasets, which allow graphical visualizations, and proceed to a study on a set of 163251 MLPs trained on well known benchmarks using various combinations of robustness and regularization types. Huber loss combined with L2 - regularization turns out to outperform other choices; this combination is recommendable whenever the data do not contain a large proportion of outliers.

Permanent Link: <https://hdl.handle.net/11104/0334710>

0562528 - ÚI 2023 CH eng C - Conference Paper (international conference)

Figueroa-Garcia, J.C. - Neruda, Roman - Chalco-Cano, Y.

An Experimental Study on Fuzzy Markov Chains Under Mn Generalized Mean Relation.

Applications of Fuzzy Techniques: Proceedings of the 2022 Annual Conference of the North American Fuzzy Information Processing Society NAFIPS 2022. Cham: Springer, 2023 - (Dick, S.; Kreinovich, V.; Lingras, P.). Lecture Notes in Networks and Systems. ISBN 978-3-031-16037-0. ISSN 2367-3370.

[NAFIPS 2022: Annual Conference of the North American Fuzzy Information Processing Society / Halifax (CA), 31.05.2022-03.06.2022]

Institutional support: RVO:67985807

OECD category: Computer sciences, information science, bioinformatics (hardware development to be 2.2, social aspect to be 5.8)

https://dx.doi.org/10.1007/978-3-031-16038-7_7

[DOI: 10.1007/978-3-031-16038-7_7](https://doi.org/10.1007/978-3-031-16038-7_7)

This chapter presents an experimental study about the use of the Mn generalized mean for the computation of the steady state of a fuzzy Markov chain and its close relationship to the probabilistic sum-product relation. The obtained evidence shows that the Mn generalized mean leads to obtain a very similar results than its probabilistic counterpart i.e. to have aperiodic limiting distributions and convergence in finite-time unlike the fuzzy max-min relation which mostly leads to non-unique solutions i.e. periodic limiting distributions.

Permanent Link: <https://hdl.handle.net/11104/0334845>

0562370 - ÚI 2023 RIV US eng C - Conference Paper (international conference)

Kalina, Jan - Vidnerová, Petra - Janáček, Patrik

Sparse Versions of Optimized Centroids.

2022 International Joint Conference on Neural Networks (IJCNN) Proceedings. Piscataway: IEEE, 2022. ISBN 978-1-7281-8671-9.

[IJCNN 2022: International Joint Conference on Neural Networks /35./, Padua (IT), 18.07.2022-23.07.2022]

R&D Projects: GA ČR(CZ) GA22-02067S

Institutional support: RVO:67985807

Keywords : image processing * templates * sparsity * variable selection * robustness * computational efficiency

OECD category: Computer sciences, information science, bioinformatics (hardware development to be 2.2, social aspect to be 5.8)

[DOI: 10.1109/IJCNN55064.2022.9892838](https://doi.org/10.1109/IJCNN55064.2022.9892838)

Centroid-based methods have an established place in a variety of tasks including object localization in images. A sophisticated method for constructing optimal centroids and corresponding weights has been proposed only recently. In order to reduce the computational demands of applying the optimal centroid, several novel sparse versions of the optimal centroids are proposed here, which are based on trimming away some of their pixels. Suitable novel sparse versions bring improvements compared to available optimal centroids. At the same time, some of the sparse optimal centroids (especially the method with thresholded optimal weights) turn out to be robust to noise in the images.

Permanent Link: <https://hdl.handle.net/11104/0334709>

0562577 - ÚI 2023 US eng C - Conference Paper (international conference)

Cabessa, Jérémie

Turing Computation with Neural Networks Composed of Synfire Rings.

2022 International Joint Conference on Neural Networks (IJCNN) Proceedings. Piscataway: IEEE, 2022. ISBN 978-1-7281-8671-9.

[IJCNN 2022: International Joint Conference on Neural Networks /35./. Padua (IT), 18.07.2022-23.07.2022]

R&D Projects: GA ČR(CZ) GA22-02067S

Institutional support: RVO:67985807

Keywords : Computers * Turing machines * Computational modeling * Biological system modeling * Neural circuits * Cells (biology) * Logic gates

OECD category: Computer sciences, information science, bioinformatics (hardware development to be 2.2, social aspect to be 5.8)

<https://dx.doi.org/10.1109/IJCNN55064.2022.9892332>

[DOI: 10.1109/IJCNN55064.2022.9892332](https://doi.org/10.1109/IJCNN55064.2022.9892332)

Synfire rings are fundamental neural circuits capable of conveying self-sustained activities in a robust and temporally precise manner. We propose a Turing-complete paradigm for neural computation based on synfire rings. More specifically, we provide an algorithmic procedure which, for any fixed-space Turing machine, builds a corresponding Boolean neural network composed of synfire rings capable of simulating it. As a consequence, any fixed-space Turing machine with tapes of length N can be simulated in linear time by some Boolean neural network composed of $O(N)$ rings and cells. The construction can naturally be extended to general Turing machines. Therefore, any Turing machine can be simulated in linear time by some Boolean neural network composed of infinitely many synfire rings. The linear time simulation relies on the possibility to mimic the behavior of the machines. In the long term, these results might contribute to the realization of biological neural computers.

Permanent Link: <https://hdl.handle.net/11104/0334887>

0562585 - ÚI 2023 eng C - Conference Paper (international conference)

Mushtaq, U. - Cabessa, Jérémie

Argument Classification with BERT plus Contextual, Structural and Syntactic Features as Text (accepted 2022).

ICONIP 2022 (in print).

[ICONIP 2022: The International Conference on Neural Information Processing /29./. Indore (IN), 22.11.2022-26.11.2022]

R&D Projects: GA ČR(CZ) GA22-02067S
Institutional support: RVO:67985807
Permanent Link: <https://hdl.handle.net/11104/0334888>

0562588 - ÚI 2023 eng C - Conference Paper (international conference)

[Cabessa, Jérémie](#) - [Hernault, H.](#) - [Lamonato, Y.](#) - [Rochat, M.](#) - [Levy, Y. Z.](#)

The ESN Torch Library: Efficient Implementation of Transformer-Based Echo State Networks (accepted 2022).

ICONIP 2022 (in print).

[ICONIP 2022: The International Conference on Neural Information Processing /29./. Indore (IN), 22.11.2022-26.11.2022]

R&D Projects: GA ČR(CZ) GA22-02067S

Institutional support: RVO:67985807

Keywords : reservoir computing * echo state networks * natural language processing (NLP) * text classification * transformers * BERT * python library * Hugging Face

Permanent Link: <https://hdl.handle.net/11104/0334891>

0562363 - ÚI 2023 RIV IE eng A - Abstract

[Mráz, J.](#) - [Brabec, Marek](#) - [Hanzlíková, I.](#)

Compartmental toxicokinetic model for urinary excretion of cleavage products resulting from adducts with globin.

Toxicology Letters. Elsevier. Roč. 368, Suppl. 1 (2022), s210-s210. ISSN 0378-4274. E-ISSN 1879-3169

Institutional support: RVO:67985807

Keywords : toxicokinetics * compartmental model * globin adduct kinetics * simulation

OECD category: Statistics and probability

[DOI: 10.1016/j.toxlet.2022.07.569](https://doi.org/10.1016/j.toxlet.2022.07.569)

ZÁKLADNÍ ÚDAJE: *Toxicology Letters.* Elsevier. Roč. 368, Suppl. 1 (2022), s210-s210. ISSN 0378-4274. E-ISSN 1879-3169.

Permanent Link: <https://hdl.handle.net/11104/0334706>

0562275 - ÚI 2023 eng A - Abstract

[Řezníček, Hynek](#) - [Geletič, Jan](#) - [Bureš, Martin](#) - [Krč, Pavel](#) - [Resler, Jaroslav](#) - [Vrbová, Kateřina](#) - [Trush, Arsenii](#) - [Michálek, Petr](#) - [Beneš, L.](#) - [Sühling, M.](#)

Different Boundary Conditions for LES Solver PALM 6.0 Used for ABL in Tunnel Experiment.

PHYSMOD 2022 Extended Abstracts. 2022.

[PHYSMOD 2022: The International Workshop on Physical Modelling of Flow and Dispersion Phenomena. 29.08.2022-31.08.2022, Prague]

R&D Projects: GA ČR(CZ) GA22-08786S

Grant - others: AV ČR(CZ) StrategieAV21/23; AV ČR(CZ) StrategieAV21/3

Program: StrategieAV; StrategieAV

Institutional support: RVO:67985807 ; RVO:68378297

Our work is motivated by modelling of pollutants and dust spread in the urban canopy which is one of the major problem for human health in inhabited areas. Majority of the pollutants can be considered as passive contaminants (driven by the flow), therefore we need to find the correct flow field for best prediction of their concentration. The talk is focused on dynamical core of the model PALM which is responsible for the best possible capture of the flow.

Permanent Link: <https://hdl.handle.net/11104/0334629>

0561930 - ÚI 2023 cze A - Abstract

[Fabián, Zdeněk](#)

Jak si Míra vybral Metriku a jak se jim daří.

[Statistické dny. Telč, 23.09.2022]

Method of presentation: Zvaná přednáška

Event organizer: Česká statistická společnost

URL events: <https://www.statspol.cz/STATDNY2022/index.php>

Institutional support: RVO:67985807

Permanent Link: <https://hdl.handle.net/11104/0334350>

0562909 - ÚI 2023 eng A - Abstract

[Neruda, Roman](#)

Evolutionary Algorithms in Machine Learning.

[Prague computer science seminar /42./. Prague, 25.04.2019]

Method of presentation: Zvaná přednáška

URL events: <https://www.praguecomputerscience.cz/?l=en&p=42>

Institutional support: RVO:67985807

Permanent Link: <https://hdl.handle.net/11104/0335076>

0563111 - ÚI 2023 eng A - Abstract

[Valenta, Zdeněk](#)

Assumptions in Modelling Survival Data - Do We Need to Care? Beyond an Introduction to Survival Analysis.

[IBIB PAN Meeting. Warsaw, 29.10.2015]

Method of presentation: Přednáška

Event organizer: Instytut Biocybernetyki i Inżynierii Biomedycznej im. Macieja Nałęczca PAN

Institutional support: RVO:67985807

<https://www.ibib.waw.pl/en/>

Permanent Link: <https://hdl.handle.net/11104/0335163>

0563110 - ÚI 2023 eng A - Abstract

[Valenta, Zdeněk](#)

Stein's Paradox and its Consequences in Analysing Multivariate Gene Expression Data.

[Bialystok University of Technology Meeting. Bialystok, 04.11.2015]

Method of presentation: Přednáška

Event organizer: Bialystok University of Technology

Institutional support: RVO:67985807

<https://pb.edu.pl/en/>

Permanent Link: <https://hdl.handle.net/11104/0335166>

0563124 - ÚI 2023 cze A - Abstract

[Valenta, Zdeněk](#)

Úvod do analýzy přežívání.

[Členská schůze České statistické společnosti. Praha, 29.01.2015]

Method of presentation: Přednáška

Institutional support: RVO:67985807

Permanent Link: <https://hdl.handle.net/11104/0335167>