Záznamy vložené do ASEP za UI (1. 5. – 31. 5. 2024)

New ICS records in ASEP (1. 5. – 31. 1. 2024)

0586183 - ÚI 2025 cze B - Monography
Pekár, S. - Brabec, Marek
Moderní analýza biologických dat 4. Analýza času do události a další metody v prostředí R.
Brno: Masarykova univerzita, 2024. 260 s. ISBN 978-80-280-0353-1
Institutional support: RVO:67985807
OECD category: Statistics and probability
https://munishop.muni.cz/obchod/knihy/moderni-analyza-biologickych-dat-4-00000000131

Kniha doplňuje předchozí tři díly o další regresní modely, konkrétně parametrické i semiparametrické modely pro analýzu času do události, regresní stromy a vybrané mnohorozměrné metody, jako je PCA nebo LDA. Text knihy je praktickou příručkou analýzy dat v prostředí R. Je sestaven z 20 vzorově vyřešených a okomentovaných příkladů, které mají za cíl nejen představit danou metodu, ale také poukázat na problémy, na které může čtenář narazit při analýze vlastních dat. Text je psán jednoduchým jazykem, srozumitelným pro čtenáře s biologickým vzděláním. Kniha je určena především studentům a kolegům z biologických oborů, ale také veterinárních, lékařských a farmaceutických oborů.
Permanent Link: https://hdl.handle.net/11104/0353770

0586115 - ÚI 2025 GB eng J - Journal Article
Bílková, Marta - Frittella, S. - Kozhemiachenko, D.
Fuzzy bi-Godel modal logic and its paraconsistent relatives.
Journal of Logic and Computation. Online 31 March 2024 (2024), č. článku exae011. ISSN 0955-792X. E-ISSN 1465-363X
R&D Projects: GA ČR(CZ) GA22-01137S
EU Projects: European Commission(XE) 101007627 - MOSAIC
Institutional support: RVO:67985807
Impact factor: 0.7, year: 2022
Method of publishing: Limited access
https://doi.org/10.1093/logcom/exae011
DOI: 10.1093/logcom/exae011

We present the axiomatisation of the fuzzy bi-Godel modal logic KbiG(f) (formulated in the language containing Delta (Baaz delta operator) and treating < (co-implication) as a defined connective). We also consider its paraconsistent relatives KbiG(f) KG(2 +/- f) and G(square,lozenge)(2 +/- f). respectively, and equipped with two fuzzy relations R+ and R- used to determine supports of truth and falsity of modal formulas. We construct embeddings of KG(2 +/- f) and G(square,lozenge)(2 +/- f) into KbiG(f) and use them to obtain the characterization of KG(2)- and G(square,lozenge)(2)-definable frames. Moreover, we study the transfer of KbiG(f) formulas into KG(2 +/- f), i.e., formulas that are KbiG(f)-valid on mono-relational frames F and F' iff they are KG(2 +/- f)-valid on their bi-relational counterparts. Finally, we establish PSpace-completeness of all considered logics.
Permanent Link: https://hdl.handle.net/11104/0353684

0585911 - ÚI 2025 RIV DE eng J - Journal Article
Kovář, R. - Brabec, Marek - Moravec, P. - Husák, T.
Fire Salamander, Salamandra salamandra, niche selection in Central European conditions.
Salamandra. Roč. 60, č. 2 (2024), s. 129-146. ISSN 0036-3375
Institutional support: RVO:67985807
Keywords : Amphibia * Caudata * Salamandridae * climate preferences * habitat preferences * logistic regression * niche modelling
OECD category: Statistics and probability
Impact factor: 1.3, year: 2022
Method of publishing: Open access
https://www.salamandra-journal.com/index.php/contents/2024-vol-60/2149-kovar,-r-,-m-brabec,-p-moravec-t-husak/file

We analyzed data from 3,546 occurrence records of Fire Salamanders (Salamandra salamandra) from the territory of the Czech Republic where it has a heterogeneous distribution pattern. Its occurrence in terrestrial habitats adjacent to breeding streams is characterized by a mean distance of 103 m, maximum 1,321 m, from the nearest stream. Based on a logistic GLM (generalized linear model) analysis we determined the Fire Salamanders' climatic and habitat associations at landscape scale in the Czech Republic. The main limiting factors for its dispersal include the proximity of small shallow streams in rolling landscapes, the pH of these streams, the presence of broad-leaf or mixed forests, humidity, solar irradiation, and severity of winters. While the absence of suitable breeding habitats is the main limiting factor for their occurrence in more expansive lowlands, factors such as lower temperatures, lower humidity, and the absence of broad-leaf and mixed forests begin to play a role with increasing altitude. Unlike cold temperatures, low amounts of precipitation and higher temperatures do not act as limiters in the Czech Republic. Fire Salamanders respond to the colder climate of higher altitudes with intensified summer activity and the purely bimodal nature of their activity (with spring and autumn peaks) tends to fade at higher altitudes.
Permanent Link: https://hdl.handle.net/11104/0353550

0585769 - ÚI 2025 GB eng J - Journal Article
Sedlár, Igor
Implicational Kleene Algebra With Domain and the Substructural Logic of Partial Correctness.
Mathematical Structures in Computer Science. Online 04 March 2024, Special Issue WoLLIC 2022 (2024). ISSN 0960-1295. E-ISSN 1469-8072.
[WoLLIC 2022: International Workshop on Logic, Language, Information, and Computation /28./. Iași, 20.09.2022-23.09.2022]
Institutional support: RVO:67985807
Keywords : Implication * Kleene algebra * partial correctness * substructural logic
Impact factor: 0.5, year: 2022
Method of publishing: Limited access
https://doi.org/10.1017/S0960129524000045
DOI: 10.1017/S0960129524000045

We show that Kozen and Tiuryn's substructural logic of partial correctness S embeds into the equational theory of Kleene algebra with domain, KAD. We provide an implicational formulation of KAD which sets S in the context of implicational extensions of Kleene algebra.
Permanent Link: https://hdl.handle.net/11104/0353448

0586036 - ÚI 2025 RIV DE eng J - Journal Article
Bartík, L. - Huszár, P. - Karlický, J. - Vlček, O. - Eben, Kryštof
Modeling the drivers of fine PM pollution over Central Europe: impacts and contributions of emissions from different sources.
Atmospheric Chemistry and Physics. Roč. 24, č. 7 (2024), s. 4347-4387. ISSN 1680-7316. E-ISSN 1680-7324
R&D Projects: GA TA ČR(CZ) SS02030031
Institutional support: RVO:67985807
OECD category: Meteorology and atmospheric sciences
Impact factor: 6.3, year: 2022
Method of publishing: Open access
https://doi.org/10.5194/acp-24-4347-2024
DOI: 10.5194/acp-24-4347-2024

Fine particulate matter (PM 2.5) is among the air pollutants representing the most critical threat to human health in Europe. For designing strategies to mitigate this kind of air pollution, it is essential to identify and quantify the sources of its components. Here, we utilized the regional chemistry transport model CAMx (Comprehensive Air Quality Model with Extensions) to investigate the relationships between emissions from different categories and the concentrations of PM 2.5 and its secondary components over Central Europe during the period 2018-2019, both in terms of the contributions of emission categories calculated by the particle source apportionment technology (PSAT) and the impacts of the complete removal of emissions from individual categories (i.e., the zero-out method). During the winter seasons, emissions from other stationary combustion (including residential combustion) were the main contributor to the domain-wide average PM 2.5 concentration (3.2 mu g m - 3), and their removal also had the most considerable impact on it (3.4 mu g m - 3). During the summer seasons, the domain-wide average PM 2.5 concentration was contributed the most by biogenic emissions (0.57 mu g m - 3), while removing emissions from agriculture-livestock had the most substantial impact on it (0.46 mu g m - 3). The most notable differences between the contributions and impacts for PM 2.5 were associated with emissions from agriculture-livestock, mainly due to the differences in nitrate concentrations, which reached up to 4.5 and 1.25 mu g m - 3 in the winter and summer seasons, respectively. We also performed a sensitivity test of the mentioned impacts on PM 2.5 on two different modules for secondary organic aerosol formation (SOAP and VBS), which showed the most considerable differences for emissions from other stationary combustion (in winter) and road transport (in summer).
Permanent Link: https://hdl.handle.net/11104/0353641
Research data: Supplement at Publisher´s website

0586040 - ÚI 2025 RIV CZ eng J - Journal Article
Kalina, Jan - Vidnerová, Petra - Janáček, Patrik
Highly Robust Training of Regularized Radial Basis Function Networks.
Kybernetika. Roč. 60, č. 1 (2024), s. 38-59. ISSN 0023-5954
R&D Projects: GA ČR(CZ) GA22-02067S
Institutional support: RVO:67985807
Keywords : effective regularization * quantile regression * regression neural networks * robust training * robustness
OECD category: Computer sciences, information science, bioinformathics (hardware development to be 2.2, social aspect to be 5.8)
Impact factor: 0.5, year: 2022
Method of publishing: Open access
https://doi.org/85190739311

DOI: 10.14736/kyb-2024-1-0038

Radial basis function (RBF) networks represent established tools for nonlinear regression modeling with numerous applications in various fields. Because their standard training is vulnerable with respect to the presence of outliers in the data, several robust methods for RBF network training have been proposed recently. This paper is interested in robust regularized RBF networks. A robust inter-quantile version of RBF networks based on trimmed least squares is proposed here. Then, a systematic comparison of robust regularized RBF networks follows, which is evaluated over a set of 405 networks trained using various combinations of robustness and regularization types. The experiments proceed with a particular focus on the effect of variable selection, which is performed by means of a backward procedure, on the optimal number of RBF units. The regularized inter-quantile RBF networks based on trimmed least squares turn out to outperform the competing approaches in the experiments if a highly robust prediction error measure is considered.
Permanent Link: https://hdl.handle.net/11104/0353642

0585895 - ÚI 2025 RIV DE eng J - Journal Article
Belda, M. - Benešová, N. - Resler, Jaroslav - Huszár, P. - Vlček, O. - Krč, Pavel - Karlický, J. - Juruš, Pavel - Eben, Kryštof
FUME 2.0 – Flexible Universal processor for Modeling Emissions.
Geoscientific Model Development. Roč. 17, č. 9 (2024), s. 3867-3878. ISSN 1991-959X. E-ISSN 1991-9603
R&D Projects: GA TA ČR(CZ) TO01000219; GA TA ČR(CZ) SS02030031
Grant - others:TA ČR(CZ) TA04020797
Institutional support: RVO:67985807
Keywords : Air quality modelling * Emission modelling * SMOKE * emission inventories * CTM
OECD category: Meteorology and atmospheric sciences
Impact factor: 5.1, year: 2022
Method of publishing: Open access
https://doi.org/10.5194/gmd-17-3867-2024
DOI: 10.5194/gmd-17-3867-2024

This paper introduces FUME 2.0, an open-source emission processor for air quality modeling, and documents the software structure, capabilities, and sample usage. FUME provides a customizable framework for emission preparation tailored to user needs. It is designed to work with heterogeneous emission inventory data, unify them into a common structure, and generate model-ready emissions for various chemical transport models (CTMs). Key features include flexibility in input data formats, support for spatial and temporal disaggregation, chemical speciation, and integration of external models like MEGAN. FUME employs a modular Python interface and PostgreSQL/PostGIS backend for efficient data handling. The workflow comprises data import, geographical transformation, chemical and temporal disaggregation, and output generation steps. Outputs for mesoscale CTMs CMAQ, CAMx, and WRF-Chem and the large-eddy-simulation model PALM are implemented along with a generic NetCDF format. Benchmark runs are discussed on a typical configuration with cascading domains, with import and preprocessing times scaling near-linearly with grid size. FUME facilitates air quality modeling from continental to regional and urban scales by enabling effective processing of diverse inventory datasets.
Permanent Link: https://hdl.handle.net/11104/0353539
Research data: Supplement at Publisher´s website

0585917 - ÚI 2025 RIV US eng J - Journal Article
Fotiadis, A. - Vlachos, Ioannis - Kugiumtzis, D.
The causality measure of partial mutual information from mixed embedding (PMIME) revisited.
Chaos. Roč. 34, č. 3 (2024), č. článku 033113. ISSN 1054-1500. E-ISSN 1089-7682
Institutional support: RVO:67985807
Keywords : Non linear dynamics * Financial economics * Information and communication theory * Information theory entropy * Signal processing * Computer simulation * Regression analysis * Statistical analysis * Stochastic processes * Time series analysis
OECD category: Computer sciences, information science, bioinformathics (hardware development to be 2.2, social aspect to be 5.8)
Impact factor: 2.9, year: 2022
Method of publishing: Limited access
https://doi.org/10.1063/5.0189056
DOI: 10.1063/5.0189056

The measure of partial mutual information from mixed embedding (PMIME) is an information theory-based measure to accurately identify the direct and directional coupling, termed Granger causality or simply causality, between the observed variables or subsystems of a high-dimensional dynamical and complex system, without any a priori assumptions about the nature of the coupling relationship. In its core, it is a forward selection procedure that aims to iteratively identify the lag-dependence structure of a given observed variable (response) to all the other observed variables (candidate drivers). This model-free approach is capable of detecting nonlinear interactions, abundantly present in real-world complex systems, and it was shown to perform well on multivariate time series of moderately high dimension. However, the PMIME presents some inefficiencies in its performance mainly when applied on strongly stochastic (linear or nonlinear) systems as it may falsely detect non-existent relationships. Moreover, and by construction, the measure cannot extract purely synergetic relationships present in a system. In the current work, the issue of false detections is addressed by introducing an improved resampling significance test and a procedure of rechecking the identified drivers (backward revision). Regarding the inability to detect synergetic relationships, the PMIME is further enhanced by checking pairs as candidate drivers for the response variable after having considered all drivers individually. The effects of these modifications are investigated in a systematic simulation study on properly designed systems involving strong stochasticity, regressor terms with synergetic effects, and a system dimension ranging from 3 to 30. The overall results of the simulations indicate that these modifications indeed improve the performance of PMIME and alleviate to a significant degree the issues of the original algorithm. Guidelines for balancing between accuracy and computational efficiency are also given, particularly relevant for real-world applications. Finally, the measure performance is investigated in the study of futures of various government bonds and stock market indices in the period around COVID-19 pandemic.
Permanent Link: https://hdl.handle.net/11104/0353555

0586300 - ÚI 2025 GB eng J - Journal Article
Šíma, Jiří - Cabessa, Jérémie - Vidnerová, Petra
On energy complexity of fully-connected layers.
Neural Networks. Online May 2024 (2024). ISSN 0893-6080. E-ISSN 1879-2782
Institutional support: RVO:67985807
Impact factor: 7.8, year: 2022
https://doi.org/10.1016/j.neunet.2024.106419
DOI: 10.1016/j.neunet.2024.106419
Permanent Link: https://hdl.handle.net/11104/0353852

0585829 - ÚI 2025 GB eng J - Journal Article
Kummer, I. - Reissigová, Jindra - Lukačišinová, A. - Ortner-Hadžiabdić, M. - Stuhec, M. - Liperoti, R. - Finne-Soveri, H. - Onder, G. - van Hout, H. P. J. - Fialová, D.
Polypharmacy and potentially inappropriate prescribing of benzodiazepines in older nursing home residents (ACCEPTED).
Annals of Medicine. Accepted May 2024 (2024). ISSN 0785-3890. E-ISSN 1365-2060
Impact factor: 4.4, year: 2022
Permanent Link: https://hdl.handle.net/11104/0353501

0586240 - ÚI 2025 GB eng J - Journal Article
Akbar, S. - Wang, J. - Ullah, A. - Latif, Yasir - Muhammad, S.
The growth and emergence of potentially dangerous glacier lakes in Astore Basin, Western Himalaya during 1993–2021.
Geomatics Natural Hazards & Risk. Roč. 15, č. 1 (2024). ISSN 1947-5705. E-ISSN 1947-5713
Grant - others:AV ČR(CZ) AP1901
Program: Akademická prémie - Praemium Academiae
Institutional support: RVO:67985807
Keywords : Glaciers * glacial lake outburst floods * remote sensing * dGPS * Astore Basin * Himalaya * LST
OECD category: Climatic research
Impact factor: 4.2, year: 2022
Method of publishing: Open access
https://doi.org/10.1080/19475705.2024.2353838
DOI: 10.1080/19475705.2024.2353838

The recent retreat of glaciers in High Mountain Asia is a major issue for downstream communities. Similarly, glaciers in the Astore Basin are melting, causing glacial lakes to expand faster, new lakes to form, and increasing the risk of glacial lakes outburst floods (GLOFs). The present study uses Landsat data from 1993 to 2021 to explore seasonal and decadal changes in glacier lakes, which are validated using an in situ differential Global Positioning System (dGPS). During the ablation period (June - October) of 2021, we observed a five-fold increase (18 to 100) in the number of glacier lakes, as well as a six-fold increase (0.62 to 3.86 km2) in lakes larger than 0.01 km2. Over the last decade, from 2011 to 2020, the number of potentially dangerous glacial lakes (PDGLs) has doubled. GLOF risk must be reduced through continual monitoring of these lakes. Prioritizing the deployment of GLOF monitoring and early warning systems, as well as sustainable water management practices, is critical for mitigation and adaptation measures in mountainous regions.
Permanent Link: https://hdl.handle.net/11104/0353825

0585914 - ÚI 2025 RIV US J - Journal Article
Gwechenberger, M. - Barón-Esquivias, G. - De Vries, T. A. C. - Siller-Matula, J. M. - Manu, M. C. - Souza, J. - Wienerroither, S. - Pecen, Ladislav - De Groot J. R. - De Caterina, R. - Kirchhof, P.
Incidence and Predictors of Worsening Renal Function in Edoxaban-Treated Atrial Fibrillation Patients Within ETNA-AF-Europe Registry.
JACC Advances. Roč. 3, č. 4 (2024), č. článku 100880. ISSN 2772-963X
Institutional support: RVO:67985807

Keywords : atrial fibrillation * direct acting oral anticoagulant * edoxaban * ETNA-AF-Europe * worsening renal function
OECD category: Cardiac and Cardiovascular systems
Method of publishing: Open access
DOI: 10.1016/j.jacadv.2024.100880

BACKGROUND: Managing patients with atrial fibrillation (AF) and worsening renal function (WRF) remains a clinical challenge due to the need of dose adjustment of non-vitamin K antagonist oral anticoagulants. Objectives: To determine the incidence of WRF in patients with AF treated with edoxaban, the association of WRF with clinical outcomes, and predictors of WRF and clinical outcomes in these patients. METHODS: This is a subanalysis of the Edoxaban Treatment in routine clinical practice for patients with non-valvular Atrial Fibrillation in Europe study (NCT02944019), an observational study of edoxaban-treated patients with AF. WRF was defined as a ≥25% reduction in creatinine clearance between baseline and 2 years. RESULTS: Of the 9,054 patients included (69% of the total 13,133 enrolled), most did not experience WRF (90.3%) during the first 2 years of follow-up. WRF occurred in 9.7% of patients. Patients with WRF had significantly higher rates of all-cause death (3.88%/y vs 1.88%/y, P < 0.0001), cardiovascular death (2.09%/y vs 0.92%/y, P < 0.0001), and major bleeding (1.51%/y vs 0.98%/y, P = 0.0463) compared with those without WRF. Rates of intracranial hemorrhage (0.18%/y vs 0.18%/y) and of any stroke/systemic embolic events were low (0.90%/y vs 0.69%/y, P = 0.3161) in both subgroups. The strongest predictors of WRF were a high CHA2DS2-VASc score, high baseline creatinine clearance, low body weight, and older age. Most predictors of WRF were also predictors of clinical outcomes. CONCLUSIONS: WRF occurred in approximately 10% of edoxaban-treated AF patients. Rates of death and major bleeding were significantly higher in patients with WRF than without. Stroke events were low in both subgroups.
Permanent Link: https://hdl.handle.net/11104/0353553

0585930 - ÚI 2025 RIV PT eng C - Conference Paper (international conference)
Kolárik, Tomáš - Ratschan, Stefan - Surynek, P.
Multi-Agent Path Finding with Continuous Time Using SAT Modulo Linear Real Arithmetic.
Proceedings of the 16th International Conference on Agents and Artificial Intelligence (Volume 1). Setubal: SCitePress, 2024 - (Rocha, A.; Steels, L.; an den Herik, J.), s. 47-58. ISBN 978-989-758-680-4. ISSN 2184-433X.
[ICAART 2024: International Conference on Agents and Artificial Intelligence /16./. Rome (IT), 24.02.2024-26.02.2024]
R&D Projects: GA ČR(CZ) GA21-09458S
Institutional support: RVO:67985807
Keywords : Multi-Agent Path Finding * Satisfiability Modulo Theories
OECD category: Computer sciences, information science, bioinformathics (hardware development to be 2.2, social aspect to be 5.8)
https://doi.org/10.5220/0012379700003636
DOI: 10.5220/0012379700003636

This paper introduces a new approach to solving a continuous-time version of the multi-agent path finding problem. The algorithm translates the problem into an extension of the classical Boolean satisfiability problem, satisfiability modulo theories (SMT), that can be solved by off-the-shelf solvers. This enables the exploitation of conflict generalization techniques that such solvers can handle. Computational experiments show that the new approach scales better with respect to the available computation time than state-of-the art approaches and is usually able to avoid their exponential behavior on a class of benchmark problems modeling a typical bottleneck situation.
Permanent Link: https://hdl.handle.net/11104/0353563

0585922 - ÚI 2025 C - Conference Paper (international conference)
Dědič, M. - Bajer, L. - Procházka, P. - Holeňa, Martin
Balancing performance and complexity with adaptive graph coarsening.
The Second Tiny Papers Track at ICLR 2024. OpenReview.net / ICLR, 2024.
[ICLR 2024. International Conference on Learning Representations /12./. Vienna (AT), 07.05.2024-11.05.2024]
Institutional support: RVO:67985807
Keywords : Graph representation learning * Graph coarsening * Performance-complexity trade-off * HARP
OECD category: Computer sciences, information science, bioinformathics (hardware development to be 2.2, social aspect to be 5.8)
https://openreview.net/forum?id=DrHwIzz93C

We present a method for graph node classification that allows a user to precisely select the resolution at which the graph in question should be simplified and through this provides a way of choosing a suitable point in the performance-complexity trade-off. The method is based on refining a reduced graph in a targeted way following the node classification confidence for particular nodes.
Permanent Link: https://hdl.handle.net/11104/0353559

0585682 - ÚI 2025 RIV CZ eng E - Electronic Document
Jareš, R. - Bauerová, P. - Belda, M. - Bureš, M. - Eben, Kryštof - Esau, I. - Fuka, V. - Geletič, Jan - Karel, J. - Keder, J. - Krč, Pavel - Miles, V. - Patiño, W. - Radović, J. - Řezníček, Hynek - Šindelářová, A. - Vlček, O. - Resler, Jaroslav
Web pages for dissemination of results (D14).
Praha: Ústav informatiky AV ČR, v. v. i., 2024
R&D Projects: GA TA ČR(CZ) TO01000219
Institutional support: RVO:67985807
Keywords : TURBAN project * website
OECD category: Meteorology and atmospheric sciences
https://project-turban.eu/

SHORT DESCRIPTION: Website title: Project TURBAN - Turbulent-resolving urban modeling of air quality and thermal comfort. ANNOTATION: In the 21st century, Europe and the rest of the world are experiencing unprecedented numbers and severity of weather extremes. Prolonged heat and cold waves significantly deteriorate the urban environmental quality and thermal comfort. Air pollution caused by local transportation, industry, heating, and other activities increases morbidity and mortality of city dwellers. The changing climate invalidates empirical statistics used to evaluate the impact of weather extremes on urban districts. In such a situation, a novel approach to assess the urban local atmospheric conditions is urgently in demand. The complex structure of the urban canopy calls for applications of fine-scale dynamic turbulence-resolving models. Such models are broadly utilized to solve engineering tasks such as designing wind parks or bridges construction, but their application to the whole-scale urban problems remains limited. The TURBAN project focuses on solving these problems. It is realized in cooperation of several institutions focused on meteorological and air quality modelling on regional and urban scale as well as on its practical application.
Permanent Link: https://hdl.handle.net/11104/0353366

0586344 - ÚI 2025 CZ cze E - Electronic Document
Kůrková, Věra - Fucimanová M.
RNDr. Věra Kůrková, DrSc. : Těším se, že přijde inspirace, o které ještě nevím.
Praha: Gender a věda - Sociologický ústav AV ČR, 2022
Institutional support: RVO:67985807
Keywords : popularizace vědy * popularisation of science * rozhovor
https://genderaveda.cz/rozhovory/rndr-vera-kurkova-drsc/
Permanent Link: https://hdl.handle.net/11104/0353892

0586341 - ÚI 2025 CZ slo E - Electronic Document
Jajcay, Nikola
Teorie entropického mozku.
Brno: Hvězdárna Brno / Youtube.com, 2021
Institutional support: RVO:67985807
Keywords : popularizace vědy * popularisation of science * přednáška
https://www.youtube.com/watch?v=K4Jjt6zjyCA

Entropie je fyzikální veličina, která nás informuje o uspořádanosti systému a s ní spojené neurčitosti. Když aplikujeme koncept entropie na mozek a začneme přemýšlet o vědomí, dostaneme se k teorii primárních a sekundárních stavů vědomí - jak vznikají, přetvářejí se a jak souvisejí s entropií. Díky neurozobrazovacím technologiím jsme schopni mozek pozorovat v různých stavech na různých škálách a třeba nedávné pozorování mozku pod vlivem psychedelických látek, jako je psilocybin, nepřímo podporují teorii entropického mozku. V přednášce se spolu podíváme na současné poznání v oblastech teorií vědomí, které jsou mimo jiné informovány psychedelickým výzkumem a historickým návratem k psychoanalytické teorii od Sigmunda Freuda.
Permanent Link: https://hdl.handle.net/11104/0353889

0586342 - ÚI 2025 SK slo E - Electronic Document
Jajcay, Nikola
Ako sa dopĺňajú spánok a učenie?
Bratislava: Biospher / Centrum vedecko-technickych informacii / Youtube.com, 2020
Institutional support: RVO:67985807
Keywords : popularizace vědy * popularisation of science * přednáška
https://www.youtube.com/watch?v=c9Q4XXmUzDw
Cesta od krátkodobej pamäte, cez dlhodobú až po generalizáciu.
Permanent Link: https://hdl.handle.net/11104/0353890

0586343 - ÚI 2025 CZ cze E - Electronic Document
Paluš, Milan - Chmel Denčevová, I.
Hovory. Host: matematik Milan Paluš.
Praha: Český rozhlas Plus, 2020
Institutional support: RVO:67985807
Keywords : popularizace vědy * popularisation of science * rozhovor
https://plus.rozhlas.cz/host-matematik-milan-palus-8158693
Permanent Link: https://hdl.handle.net/11104/0353891

0585707 - ÚI 2025 RIV DE eng V - Research Report
Resler, Jaroslav - Bauerová, P. - Belda, M. - Bureš, Martin - Eben, Kryštof - Fuka, V. - Geletič, Jan - Jareš, R. - Karel, J. - Keder, J. - Krč, Pavel - Patiño, W. - Radović, J. - Řezníček, Hynek - Sühring, M. - Šindelářová, A. - Vlček, O.
Challenges of high-fidelity air quality modeling in urban environments – PALM sensitivity study during stable conditions.
München: Europen Geosciences Union, 2024. 35 s. EGUsphere Preprints, 2024-1231.
R&D Projects: GA TA ČR(CZ) TO01000219
Research Infrastructure: e-INFRA CZ II - 90254
Institutional support: RVO:67985807
Keywords : large-eddy simulation * PALM * urban climate * air quality * ventilation * sensitivity
OECD category: Meteorology and atmospheric sciences
https://doi.org/10.5194/egusphere-2024-1231

The urban air quality is an important part of human well-being and its detailed and precise modeling is important for efficient urban planning. In this study the potential sources of errors in LES runs of the PALM model in stable conditions for a high-traffic residential area in Prague, Czech Republic with focus to street canyon ventilation are investigated. The evaluation of the PALM model simulations against observations obtained during a dedicated campaign revealed unrealistically high concentrations of modeled air pollutants for a short period during a winter inversion episode. To identify potential reasons, the sensitivities of the model to changes of meteorological boundary conditions and adjustments of model parameters were tested. The model adaptations included adding the anthropogenic heat from cars, setting a bottom limit of the subgrid-scale TKE, adjusting the profiles of parameters of the Synthetic Turbulence Generator in PALM and limiting the model time step. The study confirmed the crucial role of the correct meteorological boundary conditions for realistic air quality modeling during stable conditions. Besides this, the studied adjustments of the model parameters proved to have a significant impact in these stable conditions, resulting in a decrease of concentration overestimation in range 30–66 % while exhibiting negligible influence on model results during the rest of the episode. This suggested that the inclusion or improvement of these processes in PALM is desirable despite their negligible impact in most other conditions. Moreover, the time step limitation test revealed numerical inaccuracies caused by discretization errors which occurred during such extremely stable conditions.
Permanent Link: https://hdl.handle.net/11104/0353410

0585617 - ÚI 2025 RIV CH cze V - Research Report
Geletič, Jan - Bauerová, P. - Belda, M. - Bureš, Martin - Eben, Kryštof - Fuka, V. - Jareš, R. - Karel, J. - Keder, J. - Krč, Pavel - Patiño, W. - Radović, J. - Resler, Jaroslav - Řezníček, Hynek - Šindelářová, A. - Vlček, O.
Interpretative output for public authorities for Prague (TURBAN-D08).
[Interpretative output for public authorities for Prague (TURBAN-D08).]
Meyrin: Zenodo, 2024. 28 s. Zenodo Report, 11093034.
R&D Projects: GA TA ČR(CZ) TO01000219
Institutional support: RVO:67985807
Keywords : urban planning * modelling * adaptation * mitigation * climate change * city
OECD category: Meteorology and atmospheric sciences
https://doi.org/10.5281/zenodo.11093034
DOI: 10.5281/zenodo.11093034

ZÁKLADNÍ ÚDAJE: Meyrin: Zenodo, 2024. 28 s. Zenodo Report, 11093034. DOI: 10.5281/zenodo.11093034. ABSTRAKT: Následující dokument shrnuje hlavní výsledky projektu TURBAN, který zkoumal možnosti modelování městského prostředí s využitím nejaktuálnějších a

nejmodernějších vědeckých poznatků v oboru tzv. numerického modelování s rozlišenou turbulencí (turbulence je explicitně zahrnuta v modelu). Z pohledu projektu se jedná především o následující tři hlavní cíle: 1) vytvoření komplexního nástroje pro vyhodnocení dopadů adaptačních a mitigačních opatření, zmírnění vlivu tzv. městského tepelného ostrova a zlepšení tepelného komfortu ve městě, a vyhodnocení dopadů změn v dopravní infrastruktuře města, 2) ověření funkčnosti a validity vyvinutého nástroje, 3) pilotní nasazení na vybrané případové studie v Praze a Bergenu. Projekt TURBAN navázal na předchozí dlouhodobou spolupráci výzkumného týmu a zástupců hl.m. Prahy, která byla zahájena díky projektům Urban Heat Island (2012–2014), UrbanAdapt (2015–2016) a Urbi Pragensi (2018–2020). Uvedené projekty vytvořily základ pro implementaci řešení založených na matematicko-fyzikálních metodách využívajících modelovací přístupy různých měřítek a úrovně detailu. Projekt TURBAN byl řešen v letech 2021–2024 ve spolupráci týmů z českých a norských výzkumných institucí. Za českou republiku byly do projektu zapojeny Ústav informatiky Akademie věd ČR, v. v. i. (ÚI), Katedra fyziky atmosféry Matematicko-fyzikální fakulty Univerzity Karlovy (MFF UK), Český hydrometeorologický ústav (ČHMÚ) a ATEM – Ateliér ekologických modelů, norský partner byl Nansen Environmental and Remote Sensing Center (NERSC, Bergen, Norsko). Projekt byl podpořen Technologickou agenturou ČR (TAČR) v rámci programu Kappa, financovaný Fondy EHP a Norska.

A manual summarizing the findings learned from field observations and scenario modelling. Best practice on how urban planning, decisions of local authorities and public investment can reduce the impacts of climate change, improve air quality and living conditions are described. The main focus is on clarity and usability in practice. The document include examples of suitable solutions. The result will help to maximize the effect of the results V1, V2 and V5-V7
Permanent Link: https://hdl.handle.net/11104/0353295
Research data: Zenodo.org

0586307 - ÚI 2025 RIV eng V - Research Report
Patiño, W. - Vlček, O. - Bauerová, P. - Belda, M. - Bureš, M. - Eben, Kryštof - Fuka, V. - Geletič, Jan - Jareš, R. - Karel, J. - Keder, J. - Krč, Pavel - Radović, J. - Řezníček, Hynek - Šindelářová, A. - Resler, Jaroslav
On the Suitability of Dispersion Models of Varying Degree of Complexity for Air Quality Assessment and Urban Planning.
Social Science Research Network, 2024. 34 s. SSRN Papers, 4822006.
R&D Projects: GA TA ČR(CZ) TO01000219; GA TA ČR(CZ) SS02030031
Institutional support: RVO:67985807
Keywords : dispersion modeling * Particulate Matter * Air Pollution * urban climate * micro-scale * air quality assessment * street canyon * PALM * LES model * GRAL * Lagrangian model * ATEM * Gaussian model
OECD category: Meteorology and atmospheric sciences
https://doi.org/10.2139/ssrn.4822006
DOI: 10.2139/ssrn.4822006

The development of integrated urban services requires the implementation of informative tools that provide a balance between quality, time and costs for air quality assessment. In this framework, three modeling techniques with different levels of complexity were validated and compared during a wintertime episode with respect to PM10 concentrations measured in a built-up area in Prague (Czech Republic) characterized by a heavy traffic load. Results indicated that, although the Gaussian model ATEM could comply with common statistical performance criteria, the predictions poorly represented the spatial variability of concentrations in the domain. The Lagrangian model GRAL provided a better simulation of the effect of terrain and the formation of vortices inside street canyons, but it tended to overpredict the influence of these phenomena. Finally, the most sophisticated Large Eddy Simulation (LES) model PALM, demonstrated the best performance considering an exhaustive analysis of the

model outputs in the temporal and spatial dimensions. Apart from the validation, a sensitivity test of the selected models to driving meteorology and emission inputs was carried out. Even though advanced models have the capability to simulate complex urban environments, their suitability for urban planning is subject to further considerations, such as computational cost, user expertise and usefulness of the output provided. Due to increasing computation power and intensive work on the whole modeling chain, sophisticated models can become a routine tool for regulatory applications and be part of future integrated urban services.
Permanent Link: https://hdl.handle.net/11104/0353861

0585948 - ÚI 2025 US eng V - Research Report
Savický, Petr
On CNF formulas irredundant with respect to unit clause propagation.
Cornell: Cornell University, 2023. 19 s. arXiv.org e-Print archive, arXiv:2309.01750.
Institutional support: RVO:67985807
https://doi.org/10.48550/arXiv.2309.01750
DOI: 10.48550/arXiv.2309.01750

Two CNF formulas are called ucp-equivalent, if they behave in the same way with respect to the unit clause propagation (UCP). A formula is called ucp-irredundant, if removing any clause leads to a formula which is not ucp-equivalent to the original one. As a consequence of known results, the ratio of the size of a ucp-irredundant formula and the size of a smallest ucp-equivalent formula is at most n2, where n is the number of the variables. We demonstrate an example of a ucp-irredundant formula for a symmetric definite Horn function which is larger than a smallest ucp-equivalent formula by a factor Ω(n/lnn) and, hence, a general upper bound on the above ratio cannot be smaller than this.
Permanent Link: https://hdl.handle.net/11104/0353582

Scientific data in ASEP :
Preprint at ArXiv.org

0586302 - ÚI 2025 CZ A - Abstract
Matonoha, Ctirad
Application of a quasi-linear technique to a class of mathematical models satisfying conservation properties.
HPCSE 2024. Collection of abstracts. Ostrava: IT4Innovations National Supercomputing Center, VSB – Technical University of Ostrava, 2024.
[HPCSE 2024: High Performance Computing in Science and Engineering /6./. 20.05.2024-23.05.2024, Soláň]
Institutional support: RVO:67985807
Permanent Link: https://hdl.handle.net/11104/0353854

0585646 - ÚI 2025 DE eng A - Abstract
Hlinka, Jaroslav
On complex explanations for complex brain network dynamics.
ECMTB 2022 Book of Abstracts. Heidelberg: Heidelberg University, 2022. s. 215-216.
[ECMTB 2022. European Conference on Mathematical and Theoretical Biology /12./. 19.09.2022-23.09.2022, Heidelberg]
https://ecmtb2022.org/program/detailedprogram/
Permanent Link: https://hdl.handle.net/11104/0353328

0586348 - ÚI 2025 eng A - Abstract
Porubský, Štefan
Complex number calculator.
[International virtual symposium, hosted by the history of mathematics group of Deutsche Mathematiker Vereinigung. Virtual, 29.02.2024-29.02.2024]
Event organizer: Deutsche Mathematiker Vereinigung
Institutional support: RVO:67985807
Keywords : popularizce vědy * přednáška * Popularisation of Science
Permanent Link: https://hdl.handle.net/11104/0353894

0586059 - ÚI 2025 eng A - Abstract
Kůrková, Věra
Multivariable function approximation by ReLU networks with increasing depth.
[Workshop Stable Neuromorphic Computations. London, 29.04.2024-30.04.2024]
Method of presentation: Zvaná přednáška
Event organizer: King's College London
Institutional support: RVO:67985807
Permanent Link: https://hdl.handle.net/11104/0353659

0586346 - ÚI 2025 PL eng A - Abstract
Geletič, Jan - Krč, Pavel - Resler, Jaroslav - Bureš, Martin - Řezníček, Hynek - Belda, Michal
The complex role of trees as the most popular heat wave mitigation measure in Czech cities.
International conference Earth as a Human-Environmental System: Challenges and Dynamics. Book of abstracts. Kraków: Jagiellonian University in Kraków, 2024. s. 64-64.
[EarthHES2024: International Conference Earth as a Human-Environmental System: Challenges and Dynamics. 06.05.2024-08.05.2024, Kraków]
Grant - others:AV ČR(CZ) StrategieAV21/23
Program: StrategieAV
Institutional support: RVO:67985807
OECD category: Meteorology and atmospheric sciences
https://geo.uj.edu.pl/documents/141809825/155010702/ksi%C4%85%C5%BCka+abstrakt%C3%B3w+175+lat+IGiGP+UJ.pdf https://geo.uj.edu.pl/documents/141809825/155010702/Conference_programme.pdf
Generally, trees are widely considered the most effective heat wave mitigation measure in cities. Most of their positive effects are well described and analyzed in detail. Despite that, their effect on their surroundings is not homogeneous. Trees in urban canyons significantly affect the energy balance of horizontal and vertical surfaces. Moreover, they decrease wind velocity and block night-time radiative cooling of horizontal surfaces. The role of trees in the urban canyon is more complex – they can decrease surface temperature (ST) or mean radiant temperature (MRT) by about tens °C, same as related biometeorological indices, e.g. universal thermal climate index (UTCI) or physiological equivalent temperature (PET); maximum decrease can be as high as 10–15 °C. All these decreases are located close to trees, with only a slight effect on their surroundings. Moreover, they strongly vary during the day. New studies based on large-eddy simulation principles proved that there are more dependencies than expected; e.g. that newly planted trees on the north sides of buildings have only a minor effect on MRT, UTCI and PET. There is also a strong dependency between UTCI reduction and building height or distance between tree and building. Finally, the effect of trees is often modeled with optimal soil moisture and health conditions mainly due to a lack of data about trees in urban environments. The modern urban planning tools supported by scientific simulations could support a ‚smart city' concept
Permanent Link: https://hdl.handle.net/11104/0353893