Záznamy vložené do ASEP za UI   (1. 1. – 31. 1. 2022)
Records of ICS in ASEP   (1. 1. – 31. 1. 2022)

0550746 - ÚI 2023 RIV GB eng J - Článek v odborném periodiku
Filip, P. - Burdová, K. - Valenta, Zdeněk - Jech, R. - Kokošová, V. - Baláž, M. - Mangia, S. - Michaeli, S. - Bareš, M. - Vojtíšek, L.
Tremor associated with similar structural networks in Parkinson's disease and essential tremor.
Parkinsonism & Related Disorders. Roč. 95, February 2022 (2022), s. 28-34. ISSN 1353-8020. E-ISSN 1873-5126

Introduction: Despite substantial clinical and pathophysiological differences, the characteristics of tremor in Parkinson's disease (PD) and essential tremor (ET) patients bear certain similarities. The presented study delineates tremor-related structural networks in these two disorders. Methods: 42 non-advanced PD patients (18 tremor-dominant, 24 without substantial tremor), 17 ET, and 45 healthy controls underwent high-angular resolution diffusion-weighted imaging acquisition to reconstruct their structural motor connectomes as a proxy of the anatomical interconnections between motor network regions, implementing state-of-the-art globally optimised probabilistic tractography. Results: When compared to healthy controls, ET patients exhibited higher structural connectivity in the cerebello-thalamo-cortical network. Interestingly, the comparison of tremor-dominant PD patients and PD patients without tremor yielded very similar results – higher structural connectivity in tremor-dominant PD sharing multiple nodes with the tremor network detected in ET, despite the generally lower structural connectivity between basal ganglia and frontal cortex in the whole PD group when compared to healthy controls. Conclusion: The higher structural connectivity of the cerebello-thalamo-cortical network seems to be the dominant tremor driver in both PD and ET. While it appears to be the only tremor-related network in ET, its combination with large scale hypoconnectivity in the frontal cortico-subcortical network in PD may explain different clinical features of tremor in these two disorders.
Trvalý link: http://hdl.handle.net/11104/0326049

0550967 - ÚI 2022 CH eng M - Část monografie knihy
Horčík, Rostislav
Finite Embeddability Property for Residuated Lattices via Regular Languages.
Hiroakira Ono on Substructural Logics. Cham: Springer, 2021 - (Galatos, N.; Terui, K.), s. 273-298. Outstanding Contributions to Logic, 23. ISBN 978-3-030-76919-2

Let V be a variety of residuated lattices axiomatized by a set of identities in the language $\{\vee,\cdot,1\}$. We characterize when V has the finite embeddability property via regularity of a certain collection of languages. Several applications of this characterization are presented.
Trvalý link: http://hdl.handle.net/11104/0326248

0552192 - ÚI 2022 RIV eng J - Článek v odborném periodiku
Martinková, Z. - Honěk, A. - Brabec, Marek
Changes in the germinability of seeds of dicotyledonous herbs from anthropogenic and wild habitats during two initial years in a seedbank.
Weed Science. Roč. 69, č. 6 (2021), s. 660-672. ISSN 0043-1745. E-ISSN 1550-2759

The germinability of buried seeds changes with time, and the direction and periodicity of these changes differ among plant species. In 116 abundant dicotyledonous herb species, we investigated the changes in seed germinability that occurred during the 2-yr period following burial in the soil. We aimed to establish differences between seeds collected in "anthropogenic" (ruderal, arable land) and "wild" (grassland, forest) habitats. The seeds were buried in a field 1 mo after collection, exhumed at regular intervals, and germinated at 25 C. During the 2-yr study period, four categories of species-specific patterns of germinability changes were found: seeds demonstrating seasonal dormancy/nondormancy cycles (31 species); seeds germinating only in the first season after burial (16 species); seeds germinating steadily (38 species); and seeds whose germinability changed gradually, with increasing (7 species) or decreasing (18 species) germinability. The seeds of 6 species did not germinate at all. We found no significant difference in the frequency of these categories between species typical for anthropogenic and wild habitats. The cause for this result may be dramatic human influences (changes of agricultural practices), the pressure of which impedes the development of floras specific for certain habitats, as distinguished by the frequency of species with particular patterns of seed germinability. These frequencies varied among taxa with the growth form, seed mass, and flowering phenology of species.
Trvalý link: http://hdl.handle.net/11104/0327326

0552206 - ÚI 2022 RIV eng J - Článek v odborném periodiku
Dedeciusová, M. - Majovský, M. - Pecen, Ladislav - Beneš, V. - Netuka, D.
Long-term outcome of Simpson IV meningioma resection: Would it improve with adjuvant SRS?
Clinical Neurology and Neurosurgery. Roč. 207, August 2021 (2021), č. článku 106766. ISSN 0303-8467. E-ISSN 1872-6968

Objective: Subtotal meningioma resection (STR) is often performed to minimize surgical morbidity. Nevertheless, only a few studies have reported on patient outcome after STR. We studied the long-term outcome of SIV (Simpson grade IV) resection and identified predictive factors of overall survival (OS), progression-free survival (PFS) and time to progression (TTP). Methods: A retrospective analysis was performed on 68 patients who underwent SIV resection of meningioma (grade I) from 2004 to 2010. Data were collected from clinical, surgical and pathology records and radiological imaging. Long-term outcomes were evaluated at least 10 years after surgery. Results: Permanent morbidity was 11.8%, 30-day mortality 2.9% and progression rate 50.0% for a median followup duration of 126.6 months. Median TTP was 86.2 months. Adjuvant SRS was the only significant factor associated with longer PFS (p = 0.0052) and TTP (p = 0.0079). Higher age (p = 0.0022), KPS (p = 0.0182), postoperative ECOG score (p = 0.0182) were reliable predictors of shortened OS and aSRS (p = 0.0445) was reliable predictor of longer OS. Conclusion: STR in intracranial meningioma is still viable and often the only treatment option available in high risk patients or high-risk tumors. Although surgical morbidity and mortality are high, the OS rate was 85.3% at 5 years and 79.4% at 10 years. Because of the considerable progression rate and rather a long term OS the adjuvant SRS should be considered following SIV resection.
Trvalý link: http://hdl.handle.net/11104/0327341

0552397 - ÚI 2022 RIV PL eng J - Článek v odborném periodiku
Estrada-Gonzales, L. - Giordani, A. - Jarmzleke, T. - Klonowski, M. - Sedlár, Igor - Tedder, A.
Incorporating the Relation into the Language? A Survey of Approaches in Relating Logic.
Logic and Logical Philosophy. Roč. 30, č. 4 (2021), s. 711-739. ISSN 1425-3305
Institucionální podpora: RVO:67985807
Klíčová slova: incorporating relation * object language * relating logic * relating semantics
Obor OECD: Pure mathematics
Způsob publikování: Open access
http://dx.doi.org/10.12775/LLP.2021.014
 DOI: 10.12775/LLP.2021.014
In this paper we discuss whether the relation between formulas in the relating model can be directly introduced into the language of relating logic, and present some stances on that problem. Other questions in the vicinity, such as what kind of functor would be the incorporated relation, or whether the direct incorporation of the relation into the language of relating logic is really needed, will also be addressed.
Trvalý link: http://hdl.handle.net/11104/0327541

0551812 - ÚI 2022 RIV US eng J - Článek v odborném periodiku
Turčičová, Marie - Mandel, J. - Eben, Kryštof
Score matching filters for Gaussian Markov random fields with a linear model of the precision matrix.
Foundations of Data Science. Roč. 3, č. 4 (2021), s. 793-824. E-ISSN 2639-8001
Grant CEP: GA TA ČR(CZ) TL01000238; GA TA ČR(CZ) TO01000219
Institucionální podpora: RVO:67985807
Klíčová slova: Score matching * ensemble filter * Gaussian Markov random field * covariance modelling
Obor OECD: Statistics and probability
Způsob publikování: Open access
http://dx.doi.org/10.3934/fods.2021030
 DOI: 10.3934/fods.2021030

We present an ensemble filtering method based on a linear model for the precision matrix (the inverse of the covariance) with the parameters determined by Score Matching Estimation. The method provides a rigorous covariance regularization when the underlying random field is Gaussian Markov. The parameters are found by solving a system of linear equations. The analysis step uses the inverse formulation of the Kalman update. Several filter versions, differing in the construction of the analysis ensemble, are proposed, as well as a Score matching version of the Extended Kalman Filter.
Trvalý link: http://hdl.handle.net/11104/0327033

0551784 - ÚI 2022 RIV CH eng C - Konferenční příspěvek (zahraniční konf.)
Blažej, V. - Opler, M. - Šileikis, Matas - Valtr, P.
Non-homotopic Loops with a Bounded Number of Pairwise Intersections.
Graph Drawing and Network Visualization. 29th International Symposium GD 2021, Revised Selected Papers. Cham: Springer, 2021 - (Purchase, H.; Rutter, I.), s. 210-222. Lecture Notes in Computer Science, 12868. ISBN 978-3-030-92930-5. ISSN 0302-9743.
[GD 2021: International Symposium on Graph Drawing and Network Visualization /29./. Tübingen (DE), 14.09.2021-17.09.2021]
Grant CEP: GA ČR(CZ) GJ20-27757Y
Institucionální podpora: RVO:67985807
Klíčová slova: Graph drawing * Non-homotopic loops * Curve intersections * Plane
DOI: 10.1007/978-3-030-92931-2_15

Let V_n be a set of n points in the plane and let x∈V_n . An x-loop is a continuous closed curve not containing any point of V_n . We say that two x-loops are non-homotopic if they cannot be transformed continuously into each other without passing through a point of Vn . For n=2, we give an upper bound e^O(k^(1/2)) on the maximum size of a family of pairwise non-homotopic x-loops such that every loop has fewer than k self-intersections and any two loops have fewer than k intersections. The exponent O(k^(1/2)) is asymptotically tight. The previous upper bound 2^((2k)^4) was proved by Pach et al. [6]. We prove the above result by proving the asymptotic upper bound e^O(k^(1/2)) for a similar problem when x∈V_n, and by proving a close relation between the two problems.
Trvalý link: http://hdl.handle.net/11104/0327001

0551774 - ÚI 2022 CZ eng C - Konferenční příspěvek (zahraniční konf.)
Kalina, Jan - Vidnerová, Petra
On kernel-based nonlinear regression estimation.
The 15th International Days of Statistics and Economics Conference Proceedings. Slaný: Melandrium, 2021 - (Löster, T.; Pavelka, T.), s. 450-459. ISBN 978-80-87990-25-4.
[International Days of Statistics and Economics /15./. Prague (CZ), 09.09.2021-11.09.2021]
Grant CEP: GA ČR GA21-05325S
Institucionální podpora: RVO:67985807
Klíčová slova: nonlinear regression * machine learning * kernel smoothing * regularization * regularization networks
Obor OECD: Computer sciences, information science, bioinformathics (hardware development to be 2.2, social aspect to be 5.8)
https://msed.vse.cz/msed_2021/sbornik/toc.html

This paper is devoted to two important kernel-based tools of nonlinear regression: the Nadaraya-Watson estimator, which can be characterized as a successful statistical method in various

econometric applications, and regularization networks, which represent machine learning tools very rarely used in econometric modeling. This paper recalls both approaches and describes their common features as well as differences. For the Nadaraya-Watsonestimator, we explain its connection to the conditional expectation of the response variable. Our main contribution is numerical analysis of suitable data with an economic motivation and a comparison of the two nonlinear regression tools. Our computations reveal some tools for the Nadaraya-Watson in R software to be unreliable, others not prepared for a routine usage. On the other hand, the regression modeling by means of regularization networks is much simpler and also turns out to be more reliable in our examples. These also bring unique evidence revealing the need for a careful choice of the parameters of regularization networks

Trvalý link: http://hdl.handle.net/11104/0326994

Keikha, Vahideh - Keikha, H. - Mohades, A.
On the k-colored Rainbow Sets in Fixed Dimensions.
Combinatorial Optimization and Applications: 15th International Conference, COCOA 2021, Tianjin, China, December 17–19, 2021, Proceedings. Cham: Springer, 2021 - (Du, D.; Du, D.; Wu, C.; Xu, D.), s. 587-601. Lecture Notes in Computer Science, 13135. ISBN 978-3-030-92680-9. ISSN 0302-9743.
[COCOA 2021: International Conference on Combinatorial Optimization and Applications /15./. Tianjin (CN), 17.12.2021-19.12.2021]

In this paper, we introduce a variant of the minimum diameter color spanning set (MDCSS) problem. Let P be a set of n points of m colors in Rd . For a given k, our objective is to find a set with k points of different colors that admits the minimum possible diameter. Such a set is called a k-rainbow set. This problem has applications in database queries, mostly composed by weighted points (i.e., a positive value is assigned to each point as its weight), and seeking a maximum weight k-rainbow set. We first assume the points have equal weight and design an FPT algorithm, which we generalize to the weighted version. We also solve the decision and the enumeration version of the problem by introducing a reduction to all maximal independent sets of a bipartite graph. We also introduce a 1.154-approximation algorithm for this problem and a 2.236-approximation for the enumeration version, and we perform some experimental studies on a real data-set, as well as providing several analyses of the data-set based on the outputs of our algorithm. Our exact algorithms and the approximation algorithm for the enumeration problem have a complexity being near-linear to n in R2 .
Trvalý link: http://hdl.handle.net/11104/0326253

De Caterina, R. - De Groot J. R. - Weiss, T. W. - Kelly, P. - Monteiro, P. - Deharo J. C. - De Asmundis, C. - Lopez-De-Sa, E. - Waltenberger, J. - Steffel, J. - Levy, P. - Bakhai, A. - Pecen, Ladislav - Kirchhof, P.
Age-adjusted risk factors are independently associated with an increased risk of ischaemic stroke, transient ischaemic stroke and systemic embolism in the ETNA-AF-Europe registry.
European Heart Journal. Roč. 42, Suppl. 1 (2021), s. 474-474. ISSN 0195-668X. E-ISSN 1522-9645
Trvalý link: http://hdl.handle.net/11104/0326567

0551095 - ÚI 2022 GB eng A - Abstrakt

Kirchhof, P. - De Groot J. R. - Weiss, T. W. - Kelly, P. - Monteiro, P. - Deharo J. C. - De Asmundis, C. - Lopez-De-Sa, E. - Waltenberger, J. - Steffel, J. - Levy, P. - Bakhai, A. - [Pecen, Ladislav](#) - De Caterina, R.

Age-adjusted risk factors are independently associated with an increased risk of major bleeding during the two-year follow-up of the ETNA-AF-Europe registry.

European Heart Journal. Roč. 42, Suppl. 1 (2021), s. 577-577. ISSN 0195-668X. E-ISSN 1522-9645

Institucionální podpora: RVO:67985807

Trvalý link: http://hdl.handle.net/11104/0326429

0551292 - ÚI 2022 GB eng A - Abstrakt

De Caterina, R. - Wang, R. - Shi, L. - [Pecen, Ladislav](#) - Ye, X. - Reimitz, P. E. - Chen, C. - Unverdorben, M. - Giugliano, R. P.

Effectiveness and safety of edoxaban in atrial fibrillation patients from the ETNA-AF global registry.

European Heart Journal. Roč. 42, Suppl. 1 (2021), s. 556-556. ISSN 0195-668X. E-ISSN 1522-9645

Institucionální podpora: RVO:67985807

Trvalý link: http://hdl.handle.net/11104/0326721

0550757 - ÚI 2022 DE cze A - Abstrakt

Sühring, M. - [Resler, Jaroslav](#) - [Krč, Pavel](#)

Evaluation of surface processes in the PALM model system 6.0 for a real urban environment: a case study in Dejvice, Prague.

Kurzfassungen der Meteorologentagung DACH. Leipzig: Copernicus, 2021.

[DACH 2022: D-A-CH MeteorologieTagung. 21.03.2022-25.03.2022, Leipzig]

Grant CEP: GA KHP(CZ) UH0383; GA TA ČR(CZ) TO01000219

Institucionální podpora: RVO:67985807

Obor OECD: Meteorology and atmospheric sciences

[DOI: 10.5194/dach2022-10](#)

In recent years, the the Large-eddy simulation (LES) model PALM has been rapidly developed its capability to simulate physical processes within urban environments. For example, this includes energy-balance solvers for building and land surfaces, a radiative transfer model to account for multiple reflections and shading, a plant-canopy model to consider the effects of plants on flow (thermo-)dynamics, and a chemistry transport model, as well as nesting capabilities that enable "hot-spot" analysis, to name a few. This contribution provides an evaluation of modeled meteorological as well as ground and wall-surface quantities against dedicated in-situ measurements taken in an urban environment in Dejvice, Prague. Measurements included monitoring of surface temperature and wall heat fluxes. Simulations were performed for multiple days during several summer and winter episodes, characterized by different atmospheric conditions. To consider time-evolving synoptic conditions, boundary conditions were obtained from mesoscale WRF simulations. For the simulated episodes, the resulting temperature and wind speed within street canyons show a realistic representation of the observed state, except that the LES did not adequately capture night-time cooling near the surface in some scenarios. At most of the evaluation points, the simulated surface temperature reproduces the observed surface temperature reasonably well, for both, absolute and daily amplitude values. However, especially for the winter episodes and for modern buildings with multi-layer wall structure, the heat transfer through the walls is not well captured in some cases, leading to discrepancies between the modeled and observed wall-surface temperature. Moreover, we also show that the model performance with respect to the observations strongly depends on the

accuracy of the input data. To name a few, this includes e.g. the prescribed initial soil moisture, the given leaf-area densities to account for correct shading, or if a facade is insulated or not. Additionally, we will point out current model limitations, particularly implications accompanied by the step-like topography on the Cartesian grid, or wide glass facades that are not fully represented in terms of radiative processes. With our findings we are able to evaluate the representation of physical processes in PALM, while also pointing out specific shortcomings.
Trvalý link: http://hdl.handle.net/11104/0326059

0551093 - ÚI 2022 GB eng A - Abstrakt
Dinshaw, L. - Chen, C. - De Caterina, R. - Jiang, W. - Kim, Y. H. - Koretsune, Y. - Morrone, D. - Pecen, Ladislav - Reimitz, P. E. - Wang, C. C. - Yamashita, T. - Unverdorben, M. - Kirchhof, P.
Temporal trend of clinical events in patients with atrial fibrillation on edoxaban therapy: results from the non-interventional global ETNA-AF program.
European Heart Journal. Roč. 42, Suppl. 1 (2021), s. 2979-2979. ISSN 0195-668X. E-ISSN 1522-9645
Institucionální podpora: RVO:67985807
Trvalý link: http://hdl.handle.net/11104/0326426

0552301 - ÚI 2022 DE eng V - Výzkumná zpráva
Salim, M. - Schubert, S. - Resler, Jaroslav - Krč, Pavel - Maronga, B. - Kanani-Sühring, F. - Sühring, M. - Schneider, Ch. … celkem 9 autorů
Importance of radiative transfer processes in urban climate models: A study based on the PALM model system 6.0.
München: EGU, 2021. Geoscientific Model Development Discussions, gmd-2020-94.

DOI: 10.5194/gmd-2020-94

Including radiative transfer processes within the urban canopy layer into microscale urban climate models (UCMs) is essential to obtain realistic model results. These processes include the interaction of buildings and vegetation with shortwave and longwave radiation, thermal emission, and radiation reflections. They contribute differently to the radiation budget of urban surfaces. Each process requires different computational resources and physical data for the urban elements. This study investigates how much detail modellers should include to parameterise radiative transfer in microscale building resolving UCMs. To that end, we introduce a stepwise parameterization method to the the PALM model system 6.0 to quantify individually the effects of the main radiative transfer processes on the radiation budget and on the flow field. We quantify numerical simulations of both simple and realistic urban configurations to identify the radiative transfer processes which have major effects on the radiation budget, such as surface and vegetation interaction with short wave and long wave radiation, and those which have minor effects, such as multiple reflections. The study also shows that radiative transfer processes within the canopy layer implicitly affect the incoming radiation since the radiative transfer model is coupled to the radiation model. The flow field changes considerably in response to the radiative transfer processes included in the model. The study highlights those processes which are essentially needed to assure acceptable quality of the flow field. Omitting any of these processes may lead to high uncertainties in the model results.
Trvalý link: http://hdl.handle.net/11104/0327431

0550948 - ÚI 2022 RIV CZ L4 - Software
Cakan, C. - [Jajcay, Nikola](#)
neurolib.
Interní kód: neurolib ; 2021
Technické parametry: neurolib is a python library, and as such requires working installation of python. neurolib is tested and runs without problems on Linux systems (python versions 3.6 — 3.8) and macOS systems (python versions 3.6 — 3.7). neurolib requires several third-party python libraries (such as numpy, scipy, xarray and others), all of these are open sourced and will be installed automatically during neurolib installation via pip.
Ekonomické parametry: neurolib is very easy-to-use python library for whole-brain modelling. Due to the use of numba compiler, it is one of the fastest brain simulator to the best of our knowledge. Its modular structure allows for easy prototyping of new models, and thanks to the MultiModel framework it easily allows for heterogeneous modelling, where multiple model types and definitions can be coupled together and simulated as a whole. Moreover, it is the only brain simulation library that comes with built-in module for parameter explorations and parameter optimisation using genetic algorithms. neurolib is available under MIT licence.
Grant CEP: GA MŠk(CZ) EF19_074/0016209
Institucionální podpora: RVO:67985807
Klíčová slova: brain modelling * population models * python
Obor OECD: Neurosciences (including psychophysiology
https://github.com/neurolib-dev/neurolib

neurolib is a simulation and optimization framework for whole-brain modeling. It allows you to implement your own neural mass models which can simulate fMRI BOLD activity. neurolib helps you to analyse your simulations, to load and handle structural and functional brain data, and to use powerful evolutionary algorithms to tune your model's parameters and fit it to empirical data. You can chose from different neural mass models to simulate the activity of each brain area. The main implementation is a mean-field model of spiking adaptive exponential integrate-and-fire neurons (AdEx) called ALNModel where each brain area contains two populations of excitatory and inhibitory neurons.
Trvalý link: http://hdl.handle.net/11104/0326235

0551307 - ÚI 2022 GB eng A - Abstrakt
Siller-Matula, J. M. - [Pecen, Ladislav](#) - Patti, G. - Kirchhof, P. - De Caterina, R.
Heart failure subtypes and thromboembolic risk in patients with atrial fibrillation in the PREFER in AF registry.
European Heart Journal. Roč. 38, suppl. 1 (2017), s. 1028-1028. ISSN 0195-668X. E-ISSN 1522-9645
Institucionální podpora: RVO:67985807
Trvalý link: http://hdl.handle.net/11104/0326733

0551308 - ÚI 2022 GB eng A - Abstrakt
Cavallari, I. - Patti, G. - Lucerna, M. - [Pecen, Ladislav](#) - Siller-Matula, J. M. - Kirchhof, P. - De Caterina, R.
Net clinical benefit of oral anticoagulation in very elderly patients with atrial fibrillation: a sub-analysis from the PREFER in AF registry.
European Heart Journal. Roč. 38, suppl. 1 (2017), s. 1068-1068. ISSN 0195-668X. E-ISSN 1522-9645
Institucionální podpora: RVO:67985807
Trvalý link: http://hdl.handle.net/11104/0326735