Záznamy vložené do ASEP za UI (1. – 28. 2. 2021)

Tedder, Andrew
Information Flow in Logics in the Vicinity of BB.

Situation theory, and channel theory in particular, have been used to provide motivational accounts of the ternary relation semantics of relevant, substructural, and various non-classical logics. Among the constraints imposed by channel-theory, we must posit a certain existence criterion for situations which result from the composites of multiple channels (this is used in modeling information flow). In associative non-classical logics, it is relatively easy to show that a certain such condition is met, but the problem is trickier in non-associative logics. Following Tedder (2017), where it was shown that the conjunction-conditional fragment of the logic B admits the existence of composite channels, I present a generalised ver- sion of the previous argument, appropriate to logics with disjunction, in the neighbourhood ternary relation semantic framework. I close by suggesting that the logic BB+(^I), which falls between Lavers' system BB+ and B+ , satisfies the conditions for the general argument to go through (and prove that it satisfies all but one of those conditions).
Trvalý link: http://hdl.handle.net/11104/0317779

Chen, Y. - Shen, H. - Kaiser, J. - Hu, Y. - Capps, S. L. - Zhao, S. - Hakami, A. - Shih, J. S. - Pavur, G. K. - Turner, M.D. - Henze, D. K. - Resler, Jaroslav - Nenes, A. - Napelenok, S. - Bash, J. - Fahey, K. - Carmichael, G. R. - Chai, T. - Clarisse, L. - Coheur, P. F. - Van Damme, M. - Russel, A.
High-resolution Hybrid Inversion of IASI Ammonia Columns to Constrain US Ammonia Emissions Using the CMAQ Adjoint Model.

Ammonia (NH3) emissions have large impacts on air quality and nitrogen deposition, influencing human health and the well-being of sensitive ecosystems. Large uncertainties exist in the "bottom-up" NH3 emission inventories due to limited source information and a historical lack of measurements, hindering the assessment of NH3-related environmental impacts. The increasing capability of satellites to measure NH3 abundance and the development of modeling tools enable us to better constrain NH3 emission estimates at high spatial resolution. In this study, we constrain the NH3 emission estimates from the widely used 2011 National Emissions Inventory (2011 NEI) in the US using Infrared Atmospheric Sounding Interferometer NH3 column density measurements (IASI-NH3) gridded at a 36 km by 36 km horizontal resolution. With a hybrid inverse modeling approach, we use the Community Multiscale Air Quality Modeling System (CMAQ) and its multiphase adjoint model to optimize NH3 emission estimates in April, July, and October. Our optimized emission estimates suggest that the total NH3 emissions are biased low by 26 % in 2011 NEI in April with overestimation in the Midwest and underestimation in the Southern States. In July and October, the estimates from NEI agree well with the optimized emission estimates, despite a low bias in hotspot regions. Evaluation of the inversion performance using independent observations shows reduced

underestimation in simulated ambient NH3 concentration in all 3 months and reduced underestimation in NH+4 wet deposition in April. Implementing the optimized NH3 emission estimates improves the model performance in simulating PM2.5 concentration in the Midwest in April. The model results suggest that the estimated contribution of ammonium nitrate would be biased high in a priori NEI-based assessments. The higher emission estimates in this study also imply a higher ecological impact of nitrogen deposition originating from NH3 emissions.
Trvalý link: http://hdl.handle.net/11104/0317763

0539742 - ÚI 2021 RIV CZ eng V - Výzkumná zpráva
Svítek, M. - Přibyl, O. - Vorel, J. - Garlík, B. - Resler, Jaroslav - Kozhevnikov, S. - Krč, Pavel - Geletič, Jan - Daniel, Milan - Dostál, R. - Janča, T. - Myška, V. - Aralkina, O. - Pereira, A. M.
City simulation software for modeling, planning, and strategic assessment of territorial city units.
1.1. - Prague: CTU & ICS CAS, 2021. 68 s. Technical Report.
Grant CEP: GA TA ČR(CZ) TN01000024
Institucionální podpora: RVO:67985807
Kód oboru RIV: IN - Informatika
Obor OECD: Computer sciences, information science, bioinformathics (hardware development to be 2.2, social aspect to be 5.8)

The Smart Resilience City concept is a new vision of a city as a digital platform and eco-system of smart services where agents of people, things, documents, robots, and other entities can directly negotiate with each other on resource demand principals providing the best possible solution. It creates the smart environment making possible self-organization in sustainable or, when needed, resilient way of individuals, groups and the whole system objectives.
Trvalý link: http://hdl.handle.net/11104/0317440

0539725 - ÚI 2022 eng C - Konferenční příspěvek (zahraniční konf.)
Hlaváčková-Schindler, Kateřina - Plant, C.
Poisson Graphical Granger Causality by Minimum Message Length.
Machine Learning and Knowledge Discovery in Databases. Cham: Springer, 2021 - (Hutter, F.; Kersting, K.; Lijffijt, J.; Valera, I.). Lecture Notes in Artificial Intelligence, 12457. ISBN 978-3-030-67657-5.
[ECML PKDD 2020: The European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases. Ghent / Virtual (BE), 14.09.2020-18.09.2020]
Trvalý link: http://hdl.handle.net/11104/0317427

0539705 - ÚI 2022 CH eng C - Konferenční příspěvek (zahraniční konf.)
Blažej, V. - Opler, M. - Šileikis, Matas - Valtr, P.
On the Intersections of Non-homotopic Loops.
Algorithms and Discrete Applied Mathematics. Cham: Springer, 2021 - (Mudgal, A.; Subramanian, C.), s. 196-205. Lecture Notes on Computer Science, 12601. ISBN 978-3-030-67898-2. ISSN 0302-9743.
[CALDAM 2021: The International Conference on Algorithms and Discrete Applied Mathematics /7./. Rupnagar (IN), 11.02.2021-13.02.2021]
Grant CEP: GA ČR(CZ) GJ20-27757Y
Institucionální podpora: RVO:67985807
Klíčová slova: Graph drawing * Non-homotopic loops * Curve intersections * Plane
https://link.springer.com/chapter/10.1007%2F978-3-030-67899-9_15
 DOI: 10.1007/978-3-030-67899-9_15

Let $V=\{v1,\ldots,vn\}$ be a set of n points in the plane and let $x \in V$. An x-loop is a continuous closed curve not containing any point of V, except of passing exactly once through the point x. We say that two x-loops are non-homotopic if they cannot be transformed continuously into each other without passing through a point of V. For n=2 , we give an upper bound $2O(k)$ 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. This result is inspired by a very recent result of Pach, Tardos, and Tóth who proved the upper bounds 216k4 for the slightly different scenario when $x \notin V$.
Trvalý link: http://hdl.handle.net/11104/0317418

0539647 - ÚI 2022 RIV eng C - Konferenční příspěvek (zahraniční konf.)
Hartman, David - Pokorná, A. - Valtr, P.
On the Connectivity and the Diameter of Betweenness-Uniform Graphs.
Algorithms and Discrete Applied Mathematics. Cham: Springer, 2021 - (Mudgal, A.; Subramanian, C.).
Lecture Notes on Computer Science, 12601. ISBN 978-3-030-67898-2. ISSN 0302-9743.
[CALDAM 2021: The International Conference on Algorithms and Discrete Applied Mathematics /7./.
Rupnagar (IN), 11.02.2021-13.02.2021]
Institucionální podpora: RVO:67985807
Klíčová slova: Betweenness centrality * Betweenness-uniform * Connectivity * Distance
https://link.springer.com/book/10.1007/978-3-030-67899-9
 DOI: 10.1007/978-3-030-67899-9_26

Betweenness centrality is a centrality measure based on the overall amount of shortest paths passing
through a given vertex. A graph is betweenness-uniform if all its vertices have the same betweenness
centrality. We study the properties of betweenness-uniform graphs. In particular, we show that every
connected betweenness-uniform graph is either a cycle or a 3-connected graph. Also, we show that
betweenness uniform graphs of high maximal degree have small diameter.
Trvalý link: http://hdl.handle.net/11104/0317351

0539645 - ÚI 2021 RIV RS eng C - Konferenční příspěvek (zahraniční konf.)
Kalina, Jan
Decision Support Systems: From Big Data to the Knowledge Society.
*PaKSoM 2020. Proceedings of 2nd Virtual International Conference Path to a Knowledge Society -
Managing Risks and Innovation.* Niš: Research and Development Center ALFATEC and Complex
Systems Research Center, 2020 - (Stanković, M.; Nikolić, V.), s. 3-10. ISBN 978-86-80616-06-3.
[PaKSoM 2020: Virtual International Conference Path to a Knowledge Society - Managing Risks and
Innovation /2./. Niš / Virtual (RS), 16.11.2020-17.11.2020]
Grant CEP: GA ČR(CZ) GA19-05704S
Institucionální podpora: RVO:67985807
Klíčová slova: decision making * decision support systems * Big Data * knowledge extraction *
evidence based approaches
Kód oboru RIV: IN - Informatika
Obor OECD: Computer sciences, information science, bioinformathics (hardware development to be
2.2, social aspect to be 5.8)

As the volume of available data in various fields keeps increasing, the importance of knowledge within
the economies around the world is increasing as well and the society is currently on its path towards
the ideals of the knowledge society. This paper presents decision support systems as tools
contributing to acquiring knowledge from data and thus to the rise of the knowledge society. Big Data
may be analyzed within decision support systems as well, if specific tools of deep learning are
exploited. We present here an overview of recent and inspiring decision support systems in various
fields (management, agriculture, or education) and contrast their principles and perspectives with
those for healthcare. Each domain is argued here to have its own specifics. We also expect a further
penetration of data analysis methods (i.e.an
„informatization") to diverse fields, while the society or the economies do not seem sufficiently
prepared for such trends.
Trvalý link: http://hdl.handle.net/11104/0317350

0539640 - ÚI 2021 NL eng V - Výzkumná zpráva
Wiedermann, Jiří - van Leeuwen, J.
Autonomous Vehicles that Cooperate and Understand.
Utrecht: Utrecht University, 2021. 22 s. Technical Report, UU-PCS-2021-01. ISSN 0924-3275
Grant ostatní:AV ČR(CZ) StrategieAV21/1
Program:StrategieAV
Institucionální podpora: RVO:67985807
Klíčová slova: autonomous vehicles * driving algorithm * machine consciousness * machine
understanding * philosophy of computing * safety * smart roadside infrastructure

We present a new paradigm for the research and development of autonomous vehicles from a

philosophical viewpoint. The approach takes the broader epistemic context into account in which the vehicles operate and utilizes cognitive mechanisms inspired by higher-level mental processes. The goal is to design (connected) autonomous vehicles that provably understand all traffic situations that they can perceive and that cooperate with an informed smart road infrastructure in resolving them. The features are seen as a cognitive attainment – the vehicle's ability to handle traffic situations in a way aligned with its mission, based on information about the surrounding traffic and about the past actions of the vehicle. A key ingredient of the approach is to view an autonomous vehicle as a cognitive cyber-physical human system endowed with so-called 'minimal machine consciousness', a prerequisite of machine understanding. Its on-board sensors and the external smart road infrastructure must provide a vehicle with the information that is sufficient to provably elicit its understanding of the evolving traffic situations and fulfil its mission, in cooperation with other vehicles and the smart road infrastructure. We show how the approach leads to a driving algorithm that is arguably safe and reliable for guiding a connected autonomous vehicle to its destination. We discuss the potential of the new paradigm to overcome the difficult issues in autonomous driving.
Trvalý link: http://hdl.handle.net/11104/0317346

Rocha, Israel
Improvements On Spectral Bisection.

In this paper, the third eigenvalue of the Laplacian matrix is used to provide a lower bound on the minimum cutsize. This result has algorithmic implications that are exploited in this paper. Besides, combinatorial properties of certain configurations of a graph partition which are related to the minimality of a cut are investigated. It is shown that such configurations are related to the third eigenvector of the Laplacian matrix. It is well known that the second eigenvector encodes structural information, and that can be used to approximate a minimum bisection. In this paper, it is shown that the third eigenvector carries structural information as well. Then a new spectral bisection algorithm using both eigenvectors is provided. The new algorithm is guaranteed to return a cut that is smaller or equal to the one returned by the classic spectral bisection. Also, a spectral algorithm that can refine a given partition and produce a smaller cut is provided.
Trvalý link: http://hdl.handle.net/11104/0317243

Šípek jr., A. - Gregor, V. - Klaschka, Jan - Malý, Marek - Šípek, A.
Higher incidence of congenital anomalies in children born after assisted reproduction in the Czech Republic: Population based study.
Trvalý link: http://hdl.handle.net/11104/0316802

Šípek, A. - Gregor, V. - Šípek jr., A. - Klaschka, Jan - Malý, Marek - Jírová, J.
Incidence of anencephaly in the Czech Republic: Long-term population based study.
Trvalý link: http://hdl.handle.net/11104/0316801