

CIIRC Annual Colloquium on Research Results

CACORR Program

Wednesday April 21

13:00 Colloquium introduction (Zdeněk Hanzálek)

13:00 - 13:50 Intelligent systems (INTSYS, Vladimír Mařík)

13:00 - 13:05 Vladimír Mařík: Introduction

13:05 - 13:14 Jakub Konrád: Alquist IV, Conversational AI advances

13:14 - 13:23 Radek Škoda: PowerSystem4.0 Teplator

13:23 - 13:32 Petr Kadera: Virtual Operator of Counting Machines in LEGO

13:32 - 13:41 Martin Macaš: CIRQUE: Machine Learning for Statistical Process Control in Škoda Auto

13:41 - 13:50 Aleš Procházka: Computational Intelligence and Digital Signal Processing

13:50 - 14:40 Artificial Intelligence (AIF, Josef Urban)

13:50 - 13:51 Josef Urban: Quick overview of the department and its results.

13:51 - 14:01 Barbora Hudcová and Tomáš Mikolov: Classification of Complex Systems Based on Transients.

ALife'20. (<https://direct.mit.edu/isal/proceedings/isal2020/32/367/98499>)

14:01 - 14:11 Jan Zahálka, Marcel Worring and Jarke J. Van Wijk: Intelligent and pragmatic analytic categorization of image collections. IEEE Transactions on Visualization and Computer Graphics.
(<https://ieeexplore.ieee.org/document/9230430>).

14:11 - 14:21 Mikolás Janota and António Morgado: SAT-Based Encodings for Optimal Decision Trees with Explicit Paths. SAT 2020. (https://doi.org/10.1007/978-3-030-51825-7_35).

14:21 - 14:31 Lasse Blaauwbroek, Josef Urban, Herman Geuvers: Tactician and Tactic Learning and Proving for the Coq Proof Assistant. LPAR 2020 and CICM 2020.

(https://doi.org/10.1007/978-3-030-53518-6_17 ,
<https://easychair.org/publications/paper/JLdB>).

14:31 - 14:40 Thibault Gauthier: Deep Reinforcement Learning for Synthesizing Functions in Higher-Order Logic. LPAR 2020.
(<https://easychair.org/publications/paper/Tctp>).

14:40 - 15:20 Industrial informatics (IID, Zdeněk Hanzálek)

14:40 - 14:41 Zdeněk Hanzálek: Quick overview of the department and its results.

14:41 - 14:51 Benedikt, O.: Benedikt, O. - Alikoc, B. - Sucha, P. - Celikovsky, S. - Hanzalek, Z.: A polynomial-time scheduling approach to minimize idle energy consumption: an application to an industrial furnace. Computers and Operations Research, Volume 128.

14:51 - 15:01 Vlk, M.: Vlk, M. - Hanzalek, Z. - Brejchova, K. - Tang, S. - Bhattacharjee, S. - Fu, S.: Enhancing Schedulability and Throughput of Time-Triggered Traffic in IEEE 802.1Qbv Time-Sensitive Networks. IEEE Transactions on Communications, Volume 68, Issue 11.

15:01 - 15:11 Rohaninejad, M.: Vahedi-Nouri, B. - Tavakkoli-Moghaddam, R. - Hanzalek, Z. - Arbabi, H. - Rohaninejad, M.: Incorporating order acceptance, pricing and equity considerations in the scheduling of cloud manufacturing systems: Matheuristic methods. International Journal of Production Research, Volume 59, Is. 7.

15:11 - 15:20 Klapalek, J.: Klapalek, J. - Sojka, M. - Hanzalek, Z.: Formula 1/10 Autonomous Racing Competition

15:20 - 15:50 Scientific management of platforms and RICAIP (PLAT, Vladimír Kučera)

15:20 - 15:21 Vladimír Kučera: Introduction

15:21 - 15:31 Vladimír Mařík, Tilman Becker: RICAIP Project in 2020

15:31 - 15:41 Sergey Kozhevnikov, Miroslav Svátek: Multi-agent Approach for Smart Resilient City (KOZHEVNIKOV, S., M. SVÁTEK a P. SKOBELEV. Multi-agent Approach for Smart Resilient City. In: Borangiu T., Trentesaux D., Leitão P., Cardin O., Lamouri S. (eds) Service Oriented, Holonic and Multi-Agent Manufacturing Systems for Industry of the Future. SOHOMA 2020. Studies in Computational Intelligence, vol 952. Cham: Springer, 2020. DOI 10.1007/978-3-030-69373-2_15

15:41 - 15:50 Vladimír Kučera: Decoupling with Stability (KUČERA, V. Decoupling with Stability of Linear Systems by Static-State Feedback. IEEE Transactions on Automatic Control. 2020, Early Access. DOI 10.1109/TAC.2020.3031008

Thursday April 22

13:00 - 14:15 Robotics and machine perception (RMP, Václav Hlaváč)

13:00 - 13:03 V. Hlavac: RMP Introduction

13:03 - 13:12 Josef Šivic: Y. Labbé, J. Carpentier, M. Aubry and J. Sivic, CosyPose:

Consistent multi-view multi-object 6D pose estimation, ECCV 2020

<https://www.ciirc.cvut.cz/cs/metoda-na-urceni-6d-polohy-objektu-spoluvyvinuta-na-ciirc-cvut-ziskala-oceneni-v-soutezi-na-eccv-2020/>

13:12 - 13:21 Tomáš Pajdla: C Albl, Z Kukelova, V Larsson, M Polic, T Pajdla, K

Schindler. From Two Rolling Shutters to One Global Shutter. CVPR 2020 (ORAL) [\[pdf\]](#)

[\[supp\]](#)

13:21 - 13:30 Torsten Sattler: T Schöps, V Larsson, M Pollefeys, T Sattler, Why Having

10,000 Parameters in Your Camera Model is Better Than Twelve, CVPR 2020 (ORAL)

[\[pdf\]](#)

13:30 - 13:39 Vladimír Petřík: Petřík, V.; Smutný, V.; Kyrki, V. Static Stability of Robotic

Fabric Strip Folding, IEEE-ASME TRANSACTIONS ON MECHATRONICS. 2020, 25(5),

2493-2500. ISSN 1083-4435.

13:39 - 13:48 Jan Behrens: J. Behrens, K. Stepanova, and R. Babuska. Simultaneous task

allocation and motion scheduling for complex tasks executed by multiple robots (ICRA

2020) <http://imitrob.ciirc.cvut.cz/schedulComplex.html>

13:48 - 13:57 Pavel Krsek: Selivanova, A.; Hůlka, J.; Seifert, D.; Hlaváč, V.; Krsek, P.;

Smutný, V.; Wagner, L.; Voltr, J. et al. [The use of a CZT detector with robotic systems](#),

Applied Radiation and Isotopes. 2020, 2020(166), ISSN 0969-8043.

13:57 - 14:06 Miroslav Kulich: Kulich, M., and Preucil, L. (2020). Multi-robot search for

a stationary object placed in a known environment with a combination of GRASP and

VND. In: International Transactions in Operational Research (journal publication)

[\[pdf\]](#)[\[URL\]](#)[\[BibTeX\]](#)

14:06 -14:15 Libor Přeučil: L.G. Camara, L. Přeučil. Visual Place Recognition by spatial

matching of high-level CNN features, In: Robotics and Automation Systems (journal

publication), [Volume 133](#), November 2020

14:15 - 14:55 Industrial production and automation (IPA, Michael Valášek a Petr Kolář)

14:15 -14:17 Petr Kolář IPA Introduction

14:17 -14:31 ŠIKA, Zbyněk; VYHLÍDAL, Tomáš; NEUSSER, Zdeněk. Two-dimensional

delayed resonator for entire vibration absorption. Journal of Sound and Vibration,

2021, 500: 116010.

14:31 -14:45 Michal Kuchař, Adam Peichl, Jaromír Fišer, Tomáš Vyhlídal, Hydroelectric Power-Plant Simulator. Part of NCK-KUI result: Kučera, V. et al., (2020) Library of software modules for modelling, control, and optimization of processes and systems, R – software.

14:45 -14:55 Jan Koubek, Petr Kolář et al: Laser device integrated in a machine tool (2020) G functional sample.

14:55 - 15:35 Cognitive systems and neurosciences (COGSYS, Lenka Lhotská)

14:55-15:00 Lenka Lhotská: Brief overview of CogSys research activities in 2020

15:00-15:10 Václav Křemen: Brain Co-processors: using Machine Learning in closed loop chronic brain electrical stimulation (Wang YC, Kremen V, Brinkmann BH, Middlebrooks EH, Lundstrom BN, Grewal SS, Guragain H, Wu MH, Van Gompel JJ, Klassen BT, Stead M, Worrell GA. Probing circuit of Papez with stimulation of anterior nucleus of the thalamus and hippocampal evoked potentials. *Epilepsy Res.* 2020 Jan;159:106248. doi: 10.1016/j.eplesyres.2019.106248. Epub 2019 Nov 29. PMID: 31841958. | Payne DE, Dell KL, Karoly PJ, Kremen V, Gerla V, Kuhlmann L, Worrell GA, Cook MJ, Grayden DB, Freestone DR. Identifying seizure risk factors: A comparison of sleep, weather, and temporal features using a Bayesian forecast. *Epilepsia.* 2021 Feb;62(2):371-382. doi: 10.1111/epi.16785. Epub 2020 Dec 30. PMID: 33377501; PMCID: PMC8012030. | Gregg NM, Nasser M, Kremen V, Patterson EE, Sturges BK, Denison TJ, Brinkmann BH, Worrell GA. Circadian and multiday seizure periodicities, and seizure clusters in canine epilepsy. *Brain Commun.* 2020;2(1):fcaa008. doi: 10.1093/braincomms/fcaa008. Epub 2020 Feb 6. PMID: 32161910; PMCID: PMC7052793.)

15:10-15:20 Lenka Vysloužilová: Vent-Connect - Remote Monitoring of Lung Ventilators and Monitors of Vital Functions (<https://www.ciirc.cvut.cz/vent-connect/>)

15:20-15:30 Jindřich Adolf: Remote Physical Therapy: Single RGB Camera Motion Sensing and Experimental Results (Adolf, J.; Doležal, J.; Kutílek, P.; Hourová, M.; Hejda, J.; Milerská, I.; Lhotská, L. Automatic Telerehabilitation System in a Home Environment Using Computer Vision, In: *pHealth 2020 Proceedings of the 17th International Conference on Wearable Micro and Nano Technologies for Personalized Health.* Amsterdam: IOS Press, 2020. p. 142-148. *Studies in Health Technology and Informatics.* vol. 273. ISSN 0926-9630. ISBN 978-1-64368-112-2.)

15:30-15:35 Reserve

15:35 - 16:15 Biomedical engineering and assistive technologies (BEAT, Olga Štěpánková)

15:35 -15:38 Olga Štěpánková: BEAT in 2020 (3 min)

15:38 -15:48 Milan Němý: Sensitive imaging measures for an early in vivo detection of Alzheimer's disease. (Němý, M.; Grothe, M.; Barroso, J.; Teipel, S.J.; Westman, E.; Ferreira, D.: Multimodal imaging reveals human cholinergic system functional and structural integrity in vivo , In: *Abstracts: Alzheimer's Association International*

Conference. Chicago: Alzheimer's Association, 2020. Němý, M.; Cedres, N.; Grothe, M.J.; Muehlboeck, J.-S.; Lindberg, O.; Nedelska, Z.; Štěpánková, O.; Vysloužilová, L. et al.: Cholinergic white matter pathways make a stronger contribution to attention and memory in normal aging than cerebrovascular health and nucleus basalis of Meynert Neuroimage. 2020)

15:48 -15:58 Jan Mužík et al.: Dataset of wearable sensors with possibilities for data exchange (Miroslav Muzny, Andre Henriksen, Alain Giordanengo, Jan Muzik, Astrid Grøttland, Håvard Blixgård, Gunnar Hartvigsen, Eirik Årsand: Wearable sensors with possibilities for data exchange: Analyzing status and needs of different actors in mobile health monitoring systems, International journal of medical informatics, 2020/1/1)

15:58 -16:08 Jaroslav Cibulka, Deniz Özdemir et al.: A low cost pet-like care-bot grounded in Smart Home IoT sensors as a source of interventions for PwD, (Ozdemir, D.; Cibulka, J.; Štěpánková, O.; Holmerová, I. Design and implementation framework of social assistive robotics for people with dementia - a scoping review, Health and Technology. 2021).

16:08 - 16:15 Reserve

16:15 End of the meeting