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STADIUS
Center for Dynamical Systems, Signal Processing and Data Analytics

STADIUS Newsletter

NOVEMBER

AWARDS ▪ NEWS ▪ EVENTS ▪ PROJECTS ▪ STAFF UPDATE ▪ PUBLICATIONS

Welcome

Welcome to the November Edition of the STADIUS Newsletter.

If you are looking for material from the past STADIUS seminars, or for a guide on various STADIUS procedures, you can find most of it on the STADIUS Wiki.
This is an internal website of STADIUS accessible only for STADSIU members with an ESAT account. Please take a moment to explore it:

- Home page
- Publication Guide
- STADIUS Seminars 2021
- Guide on computation resources
- ... and many more

Last week you received the first edition of the brand new external newsletter of STADIUS. Do you want to receive it in the future as well? Don't forget to subscribe for the External Newsletter. Don't hesitate to forward the subscription link to your contacts outside STADIUS.

News



Blog Lola

Increasing household electricity consumption (e.g. widespread adoption of electrical vehicles) is driving the low-voltage energy grid to its capacity limits. Simply replacing or scaling up such an infrastructure is neither trivial nor cost-effective. instead, the

Flanders AI Research Program supports research on intelligent solutions for grid management.
Jonas Soenen, Lola Botman, Konstatinos Theodorakos, Dries Van Daele, Aras Yurtman, Jessa Bekker and Koen Vanthournout wrote an Leuven.AI story about it.



Dear politicians, regulate the algorithms controlling our work

In November, KU Leuven philosopher Lode Lauwaert and Tim Christiaens (Tilburg University) wrote an open letter to Belgian politicians imploring them to speed up the regulation of AI systems monitoring employment. Although a European AI Act is underway, the authors request that Belgium already start implementing legislation when AI is used to steer or evaluate employment of people. There are countless bad examples of AI trained on biased human decisions such as: preferring men (Amazon), not recognizing people of color (Uber) and favoring reckless behaviour (Deliveroo)... The letter argues that although AI offers fantastic possibilities, some human values should not be programmed out of the system when it is used to monitor employment. Bart De Moor is one of the 101 academics who signed this letter.

- full letter (in Dutch)
- list of academics who signed the letter
- want to find out more? VAIA presents Lode Lauwaert next Tuesday, online, during lunch. "An Ethical View on AI"

And more:

- **STADIUS Spinoff Ugentec doubles its turnover thanks to covid**
  In the midst of the corona pandemic, domestic and foreign labs have automated the analysis of PCR tests using the software **FastFinder**, **developed by Ugentec**, which reduces the COVID PCR analysis time to 15 seconds. This innovation has resulted in the med-tech company from Hasselt doubling its turnover in comparison to last year. Meanwhile it is already looking beyond corona: targeting cancer and genetic testing.
  Click here to download the article (in Dutch)
- You might have heard of Telraam before? It is a measuring kit used in citizen science projects to count traffic, monitor road safety and air pollution. It is used by municipalities to evaluate circulation plans and by pressure groups to focus cities' attention towards their problems... Did you know that Telraam is a spinout of our spin-off company Transport and Mobility Leuven? Find out more about Telraam.

Events @ STADIUS

AI for Time Series: Machine learning approaches for analyzing time series from sports

When: 2/12/2021, 14:30 - 15:30

Where: Online

Ph.D. Defense of Daniel Alcaide

When: 7/12/2021, 13:30 - 15:30

Where: Auditorium Arenbergkasteel

Ph.D. Defense of Xi Shi

When: 8/12/2021, 14:00 - 16:00

Where: LETT 08.16 Blijde-Inkomststraat 21, 3000 LEUVEN

fPh.D. Defense of Dries Hendrikx

When: 13/12/2021, 17:00 - 19:00

Where: Aula Van De Tweede Hoofdwet

AI for Time Series: Statistical learning of knowledge from sequence data

When: 16/12/2021, 14:30 - 15:30

Where: Online

For more information about STADIUS events please visit the STADIUS Event webpages.

New Projects @ STADIUS

In November 5 researchers kick-off with their FWO scholarships:

- FWO-SB: **Iustina Andronic** under the supervision of Alexander Bertrand
  Closed-loop neuro-steered beamforming for hearing aid applications
- FWO-SB: **Nicolas Heintz** under the supervision of Alexander Bertrand
  Fast, adaptive and wearable auditory attention decoding: towards practical neuro-steered hearing devices
- FWO-SB: **Omer Granoviter** under the supervision of Maarten De Vos
  Automated Analysis of Kidney Transplant Biopsies
- FWO-SB: **Miguel Bhagubai** under the supervision of Maarten De Vos
  Rationale and positioning with regard to the state-of-the-art
- FWO Fundamental: **Brecht Evens** under the supervision of Panos Patrinos
  Learning to interact safely with humans: A game-theoretic control framework for next-generation autonomous systems

A warm welcome to all researchers that started at STADIUS in November!

New colleagues



Arina Epure

Hi,

My name is Arina Epure and recently I've joined the group of prof. Toon van Waterschoot as a PhD student in the UNMUTED project. That is "Understanding Music-Based Interventions to Encourage Social-Emotional Development in Groups of Adults with Autism Spectrum Disorder". My background is in acoustics which I have studied in depth during my undergraduate and master's years at Solent University and University of Southampton, respectively. From the research point of view, I am very much interested in psychoacoustics, musical acoustics and music therapy, while personally I have many hobbies, from gardening to flying.

Looking forward to meeting you!
Arina

We wish the best of luck to the researchers who will be leaving STADIUS soon

Best of luck!

John Fredy Morales Téllez, has just defended his PhD on 15th November (under the supervision of Sabine Van Huffel). He will now move to work for Imec the Netherlands. He will be in the holst centre, where he will continue doing processing and analysis of biomedical signals, but now recorded from novel wearable devices.

Publication Digest

Here's the monthly STADIUS Publications Digest, including new reports that have been added to the publications database.
Please remember to have your own reports added in the publications database and make sure your entries are kept up to date (status submitted/accepted/published) at all times.

Contact Ida for new additions and updates, do not add/update database content yourself.

21-148

Zhang J., Chatzichristos C., Vandecasteele K., Swinnen L., Broux V., Cleeren E., Van Paesschen W., De Vos M., "Automatic annotation correction for wearable EEG based epileptic seizure detection", Technical Report 21-148, ESAT-STADIUS, KU Leuven (Leuven, Belgium), 2021.

21-149

Schuurmans M., Katriniok A., Meissen C., Tseng H.E., Patrinos P., "Safe, Learning-Based MPC for Highway Driving under Lane-Change Uncertainty: A Distributionally Robust Approach", Technical Report 21-149, ESAT-STADIUS, KU Leuven (Leuven, Belgium), 2021.

21-150

Vaulet T., Al-Memar M., Fourie H., Bobdiwala S., Saso S., Pipi M., Stalder C., Bennett P., Timmerman D., Bourne T., De Moor B., "Gradient boosted trees with individual explanations : an alternative to logistic regression for viability prediction in the first trimester of pregnancy", Technical Report 21-150, ESAT-STADIUS, KU Leuven (Leuven, Belgium), 2021. *Computer Methods and Programs in Biomedicine*.
Lirias number: 3635728.

21-151

Liu F., Suykens J.A.K., Cevher V., "On the Double Descent of Random Features Models Trained with SGD", Technical Report 21-151, ESAT-STADIUS, KU Leuven (Leuven, Belgium), 2021.

21-152

Lucassen M., Suykens J.A.K., Batselier K., "Tensor Network Kalman Filtering for Large-Scale LS-SVMs", Technical Report 21-152, ESAT-STADIUS, KU Leuven (Leuven, Belgium), 2021..

21-153

Schreurs J., *Trustworthy kernel machines : diversity, robustness, and disentanglement*, PhD thesis, Faculty of Engineering, KU Leuven (Leuven, Belgium), Oct. 2021, 342 p.
Lirias number: 3558610.

21-154

Evens B., Latafat P., Themelis A., Suykens J., Patrinos P., "Neural Network Training as an Optimal Control Problem: An Augmented Lagrangian Approach", Technical Report 21-154, ESAT-STADIUS, KU Leuven (Leuven, Belgium), 2021. Accepted for publication in *60th IEEE Conference on Decision and Control*, Austin, Texas, 2021.
Lirias number: 3635729.

21-155

Evens B., Schuurmans M., Patrinos P., "Learning MPC for Interaction-Aware Autonomous Driving: A Game-Theoretic Approach", Technical Report 21-155, ESAT-STADIUS, KU Leuven (Leuven, Belgium), 2021. Accepted for publication in *60th IEEE Conference on Decision and Control*, Austin, Texas, 2021.

21-156

Brunnstrom J., Koyama S., Moonen M., "Variable span trade-off filter for sound zone control with kernel interpolation weighting", Technical Report 21-156, ESAT-STADIUS, KU Leuven (Leuven, Belgium), 2021. Accepted for publication in *60th IEEE Conference on Decision and Control*, Austin, Texas, 2021.

21-157

Shi X., *An Automated Clinical Decision Support System with Better Interpretability*, PhD thesis, Faculty of Engineering, KU Leuven (Leuven, Belgium), Oct. 2021, 195 p.
Lirias number: 3612250.

21-158

Villa A., Vandenberk B., KenttÃƒÂ¤ T., Ingelaere S., Huikuri H.V., Zabel M., Friede T., Sticherling C., Tuinenburg A., Malik M., Van Huffel S., Willems R., Varon C., "A machine learning algorithm for electrocardiographic fQRS quantification validated on multi-center data", Technical Report 21-158, ESAT-STADIUS, KU Leuven (Leuven, Belgium), 2021.

21-159

Peirelinck T., Kazmi H.S., Mbuwir B., Hermans C., Spiessens F., Suykens J.A.K., Deconinck G., "Transfer learning in demand response : a Review of algorithms for data-efficient modelling and control", Technical Report 21-159, ESAT-STADIUS, KU Leuven (Leuven, Belgium), 2021. Accepted for publication in *Energy and AI*.
Lirias number: 3623392.

21-160

Moerman T., Santos S.A., Gonzalez-Blas C.B., Simm J., Moreau Y., Aerts J., Aerts S., "GRNBoost2 and Arboreto : Efficient and scalable inference of gene regulatory networks", *Bioinformatics*, vol. 35, 2019, pp. 2159-2161.
Lirias number: 33077526.

21-161

Simm J., Arany Y., De Brouwer E., Moreau Y., "Expressive graph informer networks", *arXiv.1907.11318v2*, 2019, pp. 1-12.
Lirias number: 3309801.

21-162

Pas P., Schuurmans M., Patrinos P., "Alpaqa: A matrix-free solver for nonlinear MPC and large-scale nonconvex optimization", Technical Report 21-162, ESAT-STADIUS, KU Leuven (Leuven, Belgium), 2021.

21-163

Hendrikx D., *Applications of Network Physiology in Neonatology*, PhD thesis, Faculty of Engineering, KU Leuven (Leuven, Belgium), Dec. 2021, 326 p.
Lirias number: 3630209.

21-164

Hendrikx D., Costerus S., IJsselmuiden J., Zahn K., Perez-Ortiz A., Van Huffel S., Flint R., Caicedo A., Wijnen R., Wessel L., de Graaff J., Tibboel D., Naulaers G., "Cerebral oxygenation and activity during surgical repair of neonates with congenital diaphragmatic hernia: a comparative analysis", Technical Report 21-164, ESAT-STADIUS, KU Leuven (Leuven, Belgium), 2021. *Frontiers in Pediatrics*.
Lirias number: 3638289.

21-165

Hendrikx D., Costerus S., Van Huffel S., de Graaff J., Wijnen R., Caicedo A., Tibboel D., Naulaers G., "Heart rate variability during non-cardiac-major surgery", Technical Report 21-165, ESAT-STADIUS, KU Leuven (Leuven, Belgium), 2021.

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