



## Seminar Hora Informaticae

Institute of Computer Science, Prague

Tuesday, November 5, 2024, 14.00 – 15.30 (2 – 3:30 PM) CET

Meeting Room 318, Address: Pod Vodárenskou věží 2, Prague 8

Meeting ID: 914 0834 4018, Passcode: 668534



<https://cesnet.zoom.us/j/91408344018?pwd=x2QlZ4F42BxlMSmWc1HOwHHA7Uw7PN.1>

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**Jan Kalina, Institute of Computer Science, Prague:**

### **Non-standard situations in regression modeling: From method selection to neural networks.**

This presentation explores non-standard situations in regression modeling, emphasizing the importance of selecting appropriate methods for data analysis. Using a world tourism dataset, we demonstrate how linear regression with the commonly used Aitken estimator fails in the presence of heteroscedasticity, while robust regression quantiles offer a more suitable solution. In the second part, we examine robust versions of regularized neural networks, explaining how their regularization can be interpreted through the framework of Bayesian inference under specific assumptions. This Bayesian perspective offers a likelihood-based approach to training neural networks with prior information.

#### **References:**

[1] Kalina J., Vidnerová P., Janáček P. (2024): Highly robust training of regularized radial basis function networks. *Kybernetika* 60(1):38–59.

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**Jan Kalina** (<https://www.cs.cas.cz/staff/kalina/en>) is a researcher working at the intersection of statistics and machine learning, with a particular interest in methodologies for analyzing complex data contaminated by noise and outliers. He studied mathematical statistics at MFF UK in Prague and earned his Ph.D. from the University of Duisburg-Essen in Germany in 2007. He has been working at ICS since 2010. From 2013 to 2017, he served as the head of the Department of Medical Informatics and Biostatistics, and he is currently the deputy head of the Supervisory Board at ICS. He also serves as an associate editor of *Sequential Analysis* and is a member of the editorial board for *Applications of Mathematics*. He serves as an advisor to students at Charles University and the Czech Technical University.

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**HORA INFORMATICAЕ** (meaning: TIME FOR INFORMATICS) is a broad-spectrum scientific seminar devoted to all core areas of computer science and its interdisciplinary interfaces with other sciences and applied domains. Original contributions addressing classical and emerging topics are welcome. Founded by Jiří Wiedermann, the seminar is running since 1994 at the Institute of Computer Science of the Czech Academy of Sciences in Prague.

<https://www.cs.cas.cz/horainf>