



Seminar Hora Informaticae

Institute of Computer Science, Prague

Tuesday, December 6, 2022, 14.00 – 15.30 (2 - 3:30 PM) CET,

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

ZOOM:

<https://cesnet.zoom.us/j/95478234977?pwd=dXoyekFHbDJ0MkNrTjVVS3F2STZqUT09>

Meeting ID: 954 7823 4977 , Passcode: 712564

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### **Petra Vidnerová - Model M - an agent-based epidemiological model**

During the recent pandemic, the interest in epidemiological modeling rapidly increased. Epidemiological models improve our understanding of the dynamics of disease spread and help us during the design of various protective measures. The important family of models is formed by agent-based models. They provide simulation tools for detailed modeling of individual human behavior.

We will present our network agent model called model M. It works with a population of individuals (agents) and their contacts are modeled as a multi-graph social network according to real data based on a Czech county. Custom algorithmic procedures simulating testing, quarantine and partial closures of various contact types are implemented. The model can serve as a tool for relative comparison of the efficacy of various policies. It was also used for a study comparing various interventions in Czech primary and secondary schools, using a graph based on real data from a selected Czech school.

References:

[1] Berc, et al. Importance of vaccine action and availability and epidemic severity for delaying the second vaccine dose, Scientific Reports volume 12, Article number: 7638 (2022)

<https://doi.org/10.1038/s41598-022-11250-4>

[2] Brom, et al. Rotation-based schedules in elementary schools to prevent COVID-19 spread: A simulation study. <https://doi.org/10.1101/2021.06.28.21259628>

[4] Berc, et al. Model-M: An agent-based epidemic model of a middle-sized municipality.

<https://doi.org/10.1101/2021.05.13.21257139>

[5] Berc, et al. Model M. Software package. <https://github.com/epicity-cz/model-m>

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**Petra Vidnerová** is a scientist at the Department of Machine Learning, Institute of Computer Science of the Czech Academy of Sciences. She received her Ph.D. in theoretical computer science from Charles University in Prague in 2007.

Her research interests cover various topics of machine learning, in particular deep neural networks, adversarial examples, neural architecture search, meta-learning. Recently, she also worked on epidemic modelling.

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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>