



Seminar Hora Informaticae

Institute of Computer Science, Prague

Tuesday, January 10, 2023, 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

Lubomír Soukup, Institute of Information Theory and Automation:

How radar interferometry could reconcile fuzzy sets with probability

Introduction to radar interferometry will be presented in the framework of two different competitive data processing approaches. Processing of interferometric radar data has induced some serious practical problems that can be solved with the aid of the fuzzy sets theory as well as by means of the probability theory. As a consequence of comparison of the both approaches, probabilistic interpretation of fuzzy sets will be exposed. Moreover, fuzzy approach can serve as an approximate tool for evaluation of complicated, intractable integrals that frequently occur in fully probabilistic solution. Some other, non-traditional tools for radar data processing will be mentioned, namely spatial statistics.

References:

Olaszek, P.; Swiercz, A.; Boscagli, F. The Integration of Two Interferometric Radars for Measuring Dynamic Displacement of Bridges. *Remote Sens.* 2021, 13, 3668.

L. A. Zadeh. Discussion: Probability Theory and Fuzzy Logic Are Complementary Rather than Competitive. *Technometrics* 37, pp 271--276, 1995.

N. D. Singpurwalla and Jane M. Booker. Membership Functions and Probability Measures of Fuzzy Sets. *Journal of the American Statistical Association* 99, pp 867--877, 2004.

L. Soukup. Probabilistic representation of spatial fuzzy sets. In 12th Workshop on Uncertainty Processing (WUPES'22), pp 196-205, 2022.

Lubomír Soukup (<http://www.utia.cz/people/soukup>) is member of the Department of Image Processing at the Institute of Information Theory and Automation, Czech Academy of Sciences. His research interests are devoted to Bayesian paradigm. He applies Bayesian statistics to image processing and spatial data processing. Special emphasis has been put on elastic image registration at recent time.

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>