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Research interests

Machine learning and its applications. In particular, structured output learning, support vector machines large-scale optimization, learning from weak annotations, face recognition, computer security and traffic.

Education and Academic Qualifications

2000–2005 PhD degree in Artificial Intelligence and Biocybernetics from FEE CTU Prague.
Thesis: Optimization Algorithms for Kernel methods. Advisor: Prof. Vaclav Hlavac.
1994–2000 MSc degree in Technical Cybernetics from FEE CTU Prague.
Thesis: Pattern Recognition Programming Tools. Advisor: Prof. Vaclav Hlavac.

Employment

2008–present Assistant professor at Faculty of Electrical Engineering, CTU Prague.
2006–2008 Post-doctoral research fellow at Fraunhofer Institute FIRST.IDA in Berlin.
2004–2006 Researcher at Faculty of Electrical Engineering, CTU Prague.

Awards and grants

2019 Czech Science Foundation project GACR GA-21198S.
Complex prediction models and their learning from weakly annotated data
2015 Best Reviewer Award, Conference on Neural Information Processing Systems (NIPS).
2015 Best Student Paper and Best Runner Up Paper Award for
K.Antoniuk, V.Franc, V.Hlavac: Consistency of structured output learning with
missing labels. Asian Conference on Machine Learning (ACML).
2012 Best Student Paper Award for M.Uricar, V. Franc and V. Hlavac:
Detector of Facial Landmarks Learned by the Structured Output SVM.
International Conference on Computer Vision Theory and Applications (VISAPP).
2009–2013 Marie Curie grant. Semi-Supervised Structred Output Learning.
EU FP7 PERG04-GA-2008-239455.
2006–2008 Marie Curie grant. Scalable Online Learning Systems. EU FP6 MEIF-CT-2006-042107.
2001 Young Scientist Award for V.Franc, V. Hlavac:
A Contribution to the Schlesinger's Algorithm Separating Mixtures of Gaussian.
International Conference on Computer Analysis of Images and Patterns (CAIP).

Researcher on projects

2018 – present OP VVV project - Research Center for Informatics
2013 – 2018 Large Scale Category Retrieval.
ERC CZ grant of Ministry of Education, Youth and Sports, LL1303.
2012 – 2015 Structured Statistical Models for Image Understanding.
Grant Agency of the Czech Republic under Project P202/12/2071.
2010 – 2013 Humanoids with auditory and visual abilities in populated spaces.
FP7 EU under Project HUMAVIPS FP7-ICT-247525.
2005 – 2006 Principles of Dissimilarity-Based Pattern Recognition in Signals, Symbolic
Sequences and Images. EU INTAS project PRINCESS 04-77-7347.
2004 – 2006 Cognitive Systems using Perception-Action Learning.
FP6 EU under Project 004176 COSPAL.
2003 – 2005 Robust and adaptive approaches to scene and object recognition.
Funded by the Austrian Ministry of Education under Project CONEX GZ 45.535.
2004 European Research Network for Cognitive AI-enabled
Computer Vision Systems. EU FP5 under Project IST-2001-35454.
2001, 2003–2004 Face recognition and detection system.
Commercial project for Samsung Advanced Institute of Technology.

Patents

- 2018 Franc, V.; Sofka, M.; Bartos, K. Learning detector of malicious network traffic from weak labels. United States of America. Patent US9923912B2. 2018-03-20.
- 2018 Bartos, K.; Sofka, M.; Franc, V.; Havelka, J. Method and apparatus for aggregating indicators of compromise for use in network security. United States of America. Patent US9985982B1. 2018-05-29.

Teaching experience

- 2008–present Lecturer at FFE CTU. Statistical Machine Learning, Bioinformatics, Structured model learning, Pattern recognition.

Reviewing

- Journals IEEE PAMI, IEEE TNN, IEEE TMI, JMLR, IJCV, JAIR, Neurocomputing, Pattern Recognition
- Conferences ICML, NIPS, CVPR, ICCV, ICPR.

Publications

I have over 50 publications in referred journals and conferences. The papers have more than 1100 citations according to WoS and more than 2900 according to Google Scholar (https://scholar.google.cz/citations?user=9a5P_D8AAAAJ&hl=cs).

My h-index is 17 according to WoS, 26 according to Google Scholar and 18 according to SCOPUS.

Most publications are available online at: <http://cmp.felk.cvut.cz/~xfrancv/>

5 selected conference and journal publications with impact factor (IF) as of the date of publication:

- [1] V. Franc and B. Savchynskyy. Discriminative Learning of Max-Sum Classifiers. *Journal of Machine Learning Research*, 9:67–104, 2008 (IF 3.1).
- [2] V. Franc, S. Sonnenburg. Optimized Cutting Plane Algorithm for Large-Scale Risk Minimization. *Journal of Machine Learning Research*, 10:2157–2192, 2009, (IF 2.8).
- [3] V. Franc, A. Zien, B. Schoelkopf. Support Vector Machines as Probabilistic Models. In *Proc. of ICML*. 2011.
- [4] V. Franc, J. Čech. Learning CNNs from Weakly Annotated Facial Images. *Image and Vision Computing*, 2018, (IF 3.4)
- [5] V. Franc, D. Pruša, V. Voráček. Optimal Strategies for Reject Option Classifiers. *Journal of Machine Learning Research*, 24:1–49, 2023 (IF 5.17).