

# 2019 年机器学习、大数据与商务智能国际会议 (MLBDBI2019)

2019 International Conference on Machine Learning, Big Data and Business Intelligence

November 8-10, 2019

Taiyuan, China

## Keynote Speaker

### Prof. Nikolaos M. Freris (PHD)

Vice Dean of International College, Professor of School of Computer Science and Technology, University of Science and Technology of China (USTC)



#### Research Interests:

His research lies in cyberphysical systems: distributed estimation, optimization and control, machine learning, wireless networks, signal processing and applications in sensor networks, transportation, robotics and power systems.

#### Education:

- PhD Electrical & Computer Engineering – University of Illinois at Urbana-Champaign (2010)
- MS Mathematics – University of Illinois at Urbana-Champaign (2008)
- MS Electrical & Computer Engineering – University of Illinois at Urbana-Champaign (2007)
- Diploma Electrical & Computer Engineering – National Technical University of Athens (2005)

#### Awards & Recognition:

2019 USTC Alumni Foundation Innovation Scholar award (中国科大双创校友基金会“双创学者奖”)

2019 National 1000 Talents award (青年千人计划)

2017 Plenary speaker at the 4th International Conference on Big Data Analysis and Data Mining, Paris, Sep. 2017

2016 IEEE Senior Member

2014 IBM High Value Patent award

2012 SDM travel award

2011 IBM Invention Achievement award

2010 Gerondelis Foundation Scholarship

2008 Vodafone graduate fellowship

2001-2004 Papayriakopoulos award; Tzafetas award; Scholarship from the Greek National Scholarship Foundation

#### Publications : ([Google scholar page](#))

##### Journal Articles

1. S. Jabari, N. Freris and D. Dilip, “Sparse travel time estimation from streaming data.” Transportation Science, 2019, to appear.
2. P. Latafat, N. Freris and P. Patrinos, “A new randomized block-coordinate primal-dual algorithm for distributed optimization.” IEEE Transactions on Automatic Control, 2019.
3. A. Darabseh and N. Freris, “A software-defined control for IoT Cyberphysical Systems.” Journal of Cluster Computing, pp. 1-16, 2019.
4. M. Vlachos, N. Freris and A. Kyrillidis, “Compressive Mining: Fast and Optimal Data Mining in the Compressed Domain.” International Journal on Very Large Data Bases (VLDB Journal), vol. 24(1),

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pp. 1-24, 2015.

5. S. Zoumpoulis, M. Vlachos, N. Freris and C. Lucchese, "Right-Protected Data Publishing with Provable Distance-based Mining." *IEEE Transactions on Knowledge and Data Engineering*, vol. 26(8), pp. 2014-2028, 2014.

6. A. Zouzas and N. Freris, "Randomized Extended Kaczmarz for Solving Least Squares." *SIAM Journal on Matrix Analysis and Applications*, vol. 34(2), pp. 773-793, 2013.

7. N. Freris, C. Hsu, J. Singh and X. Zhu, "Distortion-Aware Scalable Video Streaming to Multinetwork Clients." *IEEE/ACM Transactions on Networking*, vol. 21, no.2, pp. 469-481, 2013.

8. N. Freris, S. Graham and P. R. Kumar, "Fundamental Limits on Synchronizing Clocks over Networks." *IEEE Transactions on Automatic Control*, vol. 56, no. 2, pp. 1352-1364, 2011.

9. N. Freris, H. Kowshik and P. R. Kumar, "Fundamentals of large sensor networks: Connectivity, Capacity, Clocks and Computation." *Proceedings of the IEEE*, vol. 98, no. 1, pp. 1828-1846, 2010.

Preprints

10. T. Huang, N. Freris, P. R. Kumar and L. Xie, "Forced Oscillation Localization in Electric Power Systems under Resonance Conditions." Submitted to *IEEE Transactions on Power Systems*, 2019. Under review.

## Technical Reports

1. N. Freris, O. Öçal and M. Vetterli, "Recursive Compressed Sensing," 2013.

2. N. Freris, V. Borkar and P. R. Kumar, "Model-based clock synchronization protocol for wireless sensor networks," 2013.

## Conference Papers

1. W. Li, T. Huang, N. Freris, P. R. Kumar and L. Xie, "Data-driven Localization of Forced Oscillations in Power Systems." Accepted at the 9th International Conference on Innovative Smart Grid Technologies (ISGT Asia), 2019.

2. H. Wai, N. Freris, A. Nedich and A. Scaglione, "SUCAG: Stochastic Unbiased Curvature-aided Gradient Method for Distributed Optimization." *Proceedings of the 57th IEEE Conference on Decision and Control (CDC)*, pp. 1751-1756, 2018.

3. M. Smyrnakis, N. Freris and H. Tembine, "Consensus over evolutionary graphs." *Proceedings of the 17th IEEE European Control Conference (ECC)*, June 2018.

4. T. Huang, N. Freris, P. R. Kumar and L. Xie, "Localization of forced oscillations in the power grid under resonance conditions." *Proceedings of the 52nd Annual Conference on Information Sciences and Systems (CISS)*, March 2018.

5. H. Nahas, A. Sirhindi and N. Freris, "A new solution for UWB localization: Online algorithms, implementation and testbed." *Proceedings of the 8th International Conference on Indoor Positioning and Indoor Navigation (IPIN 2017)*, Sep. 2017.

6. A. Darabseh and N. Freris, "A Software Defined Architecture for Cyberphysical Systems." *Proceedings of the 4th IEEE International Conference on Software Defined Systems (SDS 2017)*, pp. 54-60, May 2017.

7. D. Dilip, N. Freris and S. Jabari, "Sparse estimation of travel time distributions using Gamma kernels." 96th Transportation Research Board Annual Meeting (TRB'17), Jan. 2017.

8. X. Duan, N. Freris, and P. Cheng, "Secure clock synchronization under collusion attacks." *Proceedings of the 54th Annual Allerton Conference on Communication, Control, and Computing*, pp. 1142-1148, Sep. 2016.

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9. N. Freris and P. Patrinos, "Distributed computing over encrypted data." Proceedings of the 54th Annual Allerton Conference on Communication, Control, and Computing, pp. 1116-1122, Sep. 2016.
10. N. Freris, "Accelerated Compressed Sensing on streaming data." 4th European Conference on Computational Optimization (EUCCO), Sep. 2016 (invited abstract).
11. P. Sotasakis, N. Freris and P. Patrinos, "Accelerated reconstruction of a compressively sampled data stream." Proceedings of the 24th European Signal Processing Conference (EUSIPCO'16), pp. 1078-1082, Aug. 2016.
12. A. Darabseh, N. Freris, Y. Jararweh and M. Al-Ayyoub, "SDCache: Software Defined Data Caching Control for Cloud Services." Proceedings of the 4th IEEE International Conference on Future Internet of Things and Cloud (FiCloud), pp. 164-169, Aug. 2016.
13. A. Zouzias and N. Freris, "Randomized Gossip Algorithms for Solving Laplacian Systems." Proceedings of the 14th IEEE European Control Conference (ECC), pp. 1920-1925, July 2015.
14. N. Freris, O. Öçal and M. Vetterli, "Compressed Sensing of streaming data." Proceedings of the 51st Allerton Conference on Communication, Control and Computing, pp. 1242-1249, Oct. 2013.
15. G. Baechler, N. Freris, F. Quick and R. Crochiere, "Finite rate of innovation based modeling and compression of ECG signals." Proceedings of the 38th International Conference on Acoustics, Speech, and Signal Processing (ICASSP), pp. 1252-1256, May 2013.
16. N. Freris and A. Zouzias, "Fast distributed smoothing of relative measurements." Proceedings of the 51st IEEE Conference on Decision and Control (CDC), pp. 1411-1416, Dec. 2012.
17. A. Zouzias, M. Vlachos and N. Freris, "Unsupervised Sparse Matrix Co-Clustering for Marketing and Sales Intelligence." Advances in Knowledge Discovery and Data Mining, Lecture Notes in Computer Science, vol. 7301, pp. 591-603, May 2012.
18. N. Freris, M. Vlachos and S. Kozat, "Optimal Distance Estimation Between Compressed Data Series." Proceedings of the SIAM International Conference on Data Mining (SDM12), pp. 343-354, April 2012.
19. N. Freris, M. Vlachos and D. Turaga, "Cluster-Aware Compression with Provable K-means Preservation." Proceedings of the SIAM International Conference on Data Mining (SDM12), pp. 82-93, April 2012.
20. N. Freris, "Performance bounds for CSMA-based Medium Access Control." Proceedings of the 50th IEEE Conference on Decision and Control (CDC), pp. 5945-5950, Dec. 2011.
21. N. Freris, C. Hsu, J. Singh and X. Zhu, "Resource allocation for multihomed scalable video streaming to multiple clients." Proceedings of the IEEE International Symposium on Multimedia (ISM'10), pp. 9-16, Dec. 2010.
22. C. Hsu, N. Freris, J. Singh and X. Zhu, "Rate control and stream adaptation for scalable video streaming over multiple access networks." Proceedings of the 18th International Packet Video Workshop (PV'10), pp. 33-40, Dec. 2010.
23. N. Freris, V. Borkar and P. R. Kumar, "A model-based approach to clock synchronization." Proceedings of the 48th IEEE Conference on Decision and Control (CDC), pp. 5744-5749, Dec. 2009.
24. R. McCabe, N. Freris and P. R. Kumar, "Controlled Random Access MAC for Network Utility Maximization in Wireless Networks." Proceedings of the 47th IEEE Conference on Decision and Control (CDC), pp. 2350-2355, Dec. 2008.
25. N. Freris and P. R. Kumar, "Fundamental Limits on Synchronization of Affine Clocks in Networks."

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Proceedings of the 46th IEEE Conference on Decision and Control (CDC), pp. 921-926, Dec. 2007.

## **Patents:**

### Granted

1. C. Hsu, N. Freris, J. Singh and X. Zhu, "Distortion-aware multihomed scalable video streaming to multiple clients." US8793391B2, 2014.
2. N. Freris, M. Vlachos and F. Fusco "Method and device for data mining on compressed data vectors." CN104335176B, US20150046406A1, WO2013160840A1, DE112013000845T5, 2014.

### Applications

1. S. Jabari, N. Freris and D. Dilip, "Systems and methods for sparse travel time estimation." US20180232650A1, 2018.
2. N. Freris, O. Öçal and M. Vetterli, "Method for compressed sensing of streaming data and apparatus for performing the same." US20150074238A1, WO2015038648A1, CN105531934A, EP3044881A1, JP2016535962A, 2015.
3. N. Freris and M. Vlachos, "Compression of data partitioned into clusters." US 20130031063A1, 2013.

### Theses

1. N. Freris, "Wireless Networks: Model and Optimization based approaches to Clock Synchronization, Random Access MAC and Video Streaming." PhD dissertation, Electrical and Computer Engineering, University of Illinois at Urbana-Champaign, Aug. 2010.
2. N. Freris, "Fundamental limits on network clock synchronization." MS thesis, Electrical and Computer Engineering, University of Illinois at Urbana-Champaign, Dec. 2007.
3. N. Freris, "Parameter estimation of a new insulin-glucose model." Diploma thesis, Electrical and Computer Engineering, National Technical University of Athens, July 2005 (in Greek).

## **Professional Activities:**

### Plenary Talk

2017 "Exact data mining from inexact data." 4th International Conference on Big Data Analysis and Data Mining, Paris, France, Sep. 2017

### Invited Seminars

2018 Zhejiang University, University of Science and Technology of China, Chinese University of Hong Kong (Shenzhen), KTH;

2017 Arizona State University, Texas A&M University, National Technical University of Athens, NYU-Tandon School of Engineering;

2016 UC Berkeley, KU Leuven;

2015 Tsinghua University, Zhejiang University, Khalifa University, Masdar Institute;

2014 IMT-Lucca, Qualcomm, IBM Research;

2013 EPFL, ETH, Texas A&M University, Univ. of Illinois at Urbana-Champaign

### Professional Memberships

IEEE (Senior member), ACM, SIAM

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## Service:

### Editorial

Guest Editor: Special Issue on “Distributed Control and Optimization with Resource-Constrained Networked Systems,” Elsevier SI in Neurocomputing, Dec. 2017

### Conference activities

2019 5th International Conference on Big Data Computing and Communications (BigCom), Qingdao (TPC co-chair)

2018 1st International Symposium on Intelligent Robots: Autonomy and Vision (IRAV), Abu Dhabi (co-organizer)

2017 4th International Conference on Big Data Analysis and Data Mining, Paris, France (moderator)

2nd NYUAD Transportation Symposium (co-organizer)

2016 54th Allerton Conference on Communication, Control, and Computing (special session co-chair)

4th European Conference on Computational Optimization (special session chair)

1st NYUAD Transportation Symposium (co-organizer)

2015 24th International Joint Conference on Artificial Intelligence (TPC member)

2013 1st FRI workshop at EPFL (general chair)

2008 4th CSL Student Conference (general chair)

### Reviewer

IEEE: Transactions: Automatic Control, Information Theory, Networking, Signal Processing, Control of Sensor Networks, Systems, Man and Cybernetics, Industrial Informatics

Letters: Control Systems, Communications, Signal Processing

Conferences: CDC, ACC, ECC, ICASSP, ICRA

Elsevier: Journals: Automatica, Annual Reviews in Control, Systems & Control Letters, Computer Communications, Ad Hoc Networks, Transportation Policy

Springer: Journals: VLDBJ, BIT Numerical Mathematics, Numerische Mathematik, Supercomputing;

Conference: VLDB

ACM: Journal: Transactions on Networking; Conference: KDD

SIAM: Journals: SIOPT, SIMAX; Conference: SDM

AMS: Mathematics of Computation

Other: Conferences: IFAC, IJCAI, Allerton