

Sotirios K. Tasoulis

Curriculum Vitae

Last Updated: August 2, 2019

+30 6937415851

stasoulis@uth.gr

sites.google.com/site/sotiristasoulis/

CURRENT STATUS

2019 - to date **Assistant Professor**, Department of Computer Science and Biomedical Informatics, School of Sciences, University of Thessaly, Greece.

PREVIOUS ACADEMIC POSITION

2017 - 2019 **Senior Post-Doctoral Researcher**, Department of Computer Science and Biomedical Informatics, School of Sciences, University of Thessaly, Greece.

2015 - 2017 **Lecturer (Assistant Professor)**, Department of Applied Mathematics, Faculty of Engineering and Technology, Liverpool John Moores University, UK.

Member of Liverpool Centre for Data Science

2013 - 2015 **Post Doctoral Researcher**, Department of Computer Science/Helsinki Institute for Information Technology HIIT/ The Finnish Centre of Excellence in Computational Inference Research (COIN), University of Helsinki.

title *Knowledge Discovery in Big Data.*

Research Group *Complex Systems Computation Group (CoSCo)*, <http://www.hiit.fi/complex-systems-computation>

Focus area *Information Complexity and learning*, <http://www.hiit.fi/cosco/promo>

EDUCATION

2013 **Ph.D.**, Department of Computer Science and Biomedical Informatics, University of Thessaly, Greece.

thesis title *Knowledge Discovery in High Dimensional Data.*

supervisor **Vassilis P. Plagianakos**, Associate Professor at the Department of Computer Science and Biomedical Informatics, University of Thessaly, Greece.

2009 **M.Sc. in Mathematics of Computers and Decision Making**, Interdepartmental Postgraduate Program of the Department of Mathematics in collaboration with the Department of Computer Science and Computer Engineering of the University of Patras, Greece.

thesis title *Clustering of High Dimensional Data*

supervisor **Michael N. Vrahatis**, Professor at the Department of Mathematics, University of Patras, Greece.

2006 **Ptychion (4-year Bachelor) in Mathematics**, Department of Mathematics, Division of Computational Mathematics and Informatics, University of Patras, Greece.

RESEARCH VISITOR

2010 Visiting Professor Niall Adams at Imperial College London. Attend seminars and discussions, and offer lectures within the ALADDIN Project. The project was concerned with developing mechanisms, architectures, and techniques to deal with the dynamic and uncertain nature of distributed and decentralised intelligent systems.

- 2016 Visiting Professor Teemu Ross at the Department of Computer Science, University of Helsinki. The purpose of the visit is to plan and carry out joint research in the area of Big Data processing and Machine Learning.

SCHOLARSHIPS / AWARDS

- 2008 – 2010 **Scholarship for implementing an application for the Greek Payment Agency (O.P.E.K.E.P.E.):** *Upgrade the regular personnel recruitment application of the Greek Payment Agency (O.P.E.K.E.P.E.).* Basic researcher for the design, the analysis, and the implementation of the application. Duration: 08/09/2008 – 07/03/2009 and 08/09/2009 – 07/03/2010. (PHP/MySQL – Web-based application).
- 2010 – 2013 **Ph.D. Scholarship:** My Ph.D. research has been co-financed by the European Union (European Social Fund – ESF) and Greek national funds through the Operational Program “Education and Lifelong Learning” of the National Strategic Reference Framework (NSRF) – Research Funding Program: “Heracleitus II. Investing in knowledge society through the European Social Fund.” following a successfully application.
- 2010 **IEEE CIS Student Travel Grant Award** for the IEEE World Congress on Computational Intelligence 2010, (WCCI 2010), Barcelona, Spain, 2010
- 2010 The paper “*Skin lesions characterisation utilising clustering algorithms*” was nominated for the **SETN 2010 Best Student Paper Award** at the 6th Hellenic conference on Artificial Intelligence: theories, models and applications, (SETN 2010), Athens, Greece, 2010
- 2013 Successfully applied for funding by the “Youth in Action” Programme coordinated by the European Commission, to attend **BONSAI: Bridging Organizations and National Societies in Artificial Intelligence** Bran, Romania, July 24-31, 2013, representing Hellenic Association for Artificial Intelligence (EETN).
- 2016–2017 Successfully applied for Internal Research Pump Priming Award: **EU H2020: Big Data PP: Privacy-Preserving Big Data technologies.** Liverpool John Moores University.
- 2016 Successfully applied for EPSRC funded Workshop in collaboration with Dr. Liang Wang and Prof. Jon Crowcroft from University of Cambridge. **title: High Dimensional Big Data Engineering** January 2016, Computer Laboratory, University of Cambridge.
- 2016 The business plan “*Kvasir: Scalable Provision of Semantically Relevant Web Content on Big Data Framework*” was a finalist in **2016 Cambridge Postdoc Enterprise Competition** October 2016, University of Cambridge.
- 2017 Successfully applied for **Teaching Scholarship** within project “Academic teaching Experience for New post Doctoral Scientists” financed by the National Strategic Reference Framework (NSRF).
- 2017 Participated in proposal **Efficient and Robust Cognitive IoT Systems using Unreliable Sensors** by Prof. Pulkrit Grover (Carnegie Mellon University) and Prof. Teemu Roos (University of Helsinki) which is funded by the Academy of Finland and National Science Foundation (NSF).
- 2017–2019 **Post Doctoral Research Scholarship:** The proposal “Big graph mining for deciphering complex disease mechanisms” has been financed by the National Strategic Reference Framework (NSRF) Program with title: “Researcher Support with Emphasis on New Researches”.
- 2019–2022 **Research Scholarship:** The proposal “Clustering Big Data” have received funding from the Hellenic Foundation for Research and Innovation (HFRI) and the General Secretariat for Research and Technology (GSRT), under grant agreement No 1901.

TEACHING EXPERIENCE

- 2007 – 2009 Teaching assistant for undergraduate courses, Department of Mathematics, University of Patras, Greece:
- 2007 and 2008 Autumn semesters, teaching assistant for **Introduction to Computer Science**
 - 2008 and 2009 Spring semesters, teaching assistant for **Introduction to Programming**

- 2015 In charge of **"Probabilistic Models"** course, Algorithms and machine learning subprogram, Master of Science, Department of Computer Science, University of Helsinki, Finland.
- Description: Probabilistic graphical models focusing in particular on Bayesian networks, and on their applications in different probabilistic modeling tasks, <https://www.cs.helsinki.fi/en/node/79581>.
- 2015 – 2017 In charge of the following undergraduate courses, Department of Applied Mathematics, Liverpool John Moores University, UK:
- Autumn semester, **"Multivariate Analysis and Data Mining"**
 - Spring semester, **"Probability and Risk"**
 - Spring semester, **"Statistical Modeling"**
- 2017 – 2019 In charge of **"Data Mining and Big Data Analysis in Medicine and Biology"** course, Computer Science and Computational Biomedicine, Master of Science, Department of Computer Science and Biomedical Informatics, University of Thessaly, Greece.
- 2017 – 2019 In charge of **"Data Mining and Analysis in Big Data"** course, Department of Computer Science and Biomedical Informatics, University of Thessaly, Greece.
- 2018 – 2019 In charge of **"Artificial Intelligence"** course, Department of Computer Science and Biomedical Informatics, University of Thessaly, Greece.

SUPERVISING

- 2013 – 2015 During my Post Doctoral position at the University of Helsinki,
- I have been involved in the co-supervision of two post graduate students.
 - I have supervised one academic internship student.
- 2015 – 2017 During my Lecturer position at Liverpool John Moores University,
- I have supervised ten undergraduate student dissertations.
 - I have been personal tutor of 15 undergraduate students.
 - Provided 9 month industrial internship supervision of two undergraduate students:
 1. Kyle Friel - Analyst at Cheshire Datasystems Ltd (CDL).
 2. Lisa Tinkler - Commercial Finance Analyst at Eddie Stobart Logistics Limited.

EXAMINER

- 2017 Served as external PhD examiner for Dr. Rhian Natalie Davies, thesis title: **"Efficient Analysis of Data Streams"**, Lancaster University, UK.
- 2016 – 2017 Served as Master to PhD transition examiner for:
- Victor Latorre, title: "Smart Analysis of Retail Transaction Data Using Big Data".
 - Raul Casana Eslava, title: "Consumer Insights: Fisher Networks, Communities and Bayesian Networks".

INVITED TALKS AND SEMINARS

- March 2015 Invited talk in Helsinki Statistics Day, with title **"Random Projection Based Clustering for Population Genomics"**, Helsinki, Finland.
- 2011 to 2012 Seminars series in **Clustering**, Department of Computer Science and Biomedical Informatics, University of Thessaly, Greece.
- Jan. 2017 Invited talk in Liverpool John Moores University Open Day, with topic **"Math Studies at LJMU"**, Liverpool, UK.
- May 2018 Full Day Seminar with title **"Text Mining Using R"**, within the 31st Greek Conference in Statistics, Lamia, Greece.

ACADEMIC ACTIVITIES

- January 2014 – January 2015 Organizing Helsinki Institute for Information Technology HIIT lecture series at the Department of Computer Science, University of Helsinki
- October 2015 Organizing Workshop (Chair)“ Advances in high dimensional big data.” within IEEE International Conference on Big Data (IEEE BigData 2015), Oct 29-Nov 01, Santa Clara CA, USA.
- January 2016 Organizing Workshop (Chair)“High Dimensional Big Data Engineering” within Computer Laboratory, University of Cambridge, UK, January 22nd, 2016, Cambridge, UK.
- December 2016 Organizing Workshop (Chair)“ Advances in high dimensional big data.” within IEEE International Conference on Big Data (IEEE BigData 2016), 5-8 Dec, 2016, Washington D.C., USA.
- 2016 – 2017 In charge of producing annual newsletter report for the Department of Applied Mathematics at Liverpool John Moores University, UK.
- December 2017 Organizing Workshop (Chair)“ Advances in high dimensional big data.” within IEEE International Conference on Big Data (IEEE BigData 2017), 11-14 Dec, 2017, Boston, MA, USA.
- December 2018 Organizing Workshop (Chair)“ Advances in high dimensional big data.” within IEEE International Conference on Big Data (IEEE BigData 2018), 10-13 Dec., 2018, Seattle, WA, USA.

REFeree SERVICE

Transactions on Pattern Analysis and Machine Intelligence (IEEE), Journal of Classification (Springer), Sensors (MDPI), Applied Mathematics and Computation (Elsevier), The Computer Journal (Oxford Academic), International Meeting on Computational Intelligence Methods for Bioinformatics and Biostatistics (CIBB), IEEE World Congress on Computational Intelligence (IEEE WCCI), Hellenic Conference on Artificial Intelligence (SETN) and others.

Technical Program Committee Member, IEEE International Conference on Big Data (IEEE Big-Data) 2015, 2016 and 2017

COLLABORATION WITH THE INDUSTRY

- May 2015 **Elisa Corporation, Helsinki, Finland:** Elisa is a telecommunications, ICT and online service company. Elisa provides services for communication and entertainment, and tools for improving operating methods and productivity of organisations. In Finland Elisa is the market leader in mobile subscriptions. Cooperation with Vodafone and Telenor enables globally competitive services.
Topic: Consulting in Data Streams Clustering for Big Data.
- Jan.-Feb. 2016 **BIBBLIO, London, UK:** Bibblio provides great publishers, edtech platforms, institutions and archives with tools to let their users discover content. <http://bibblio.org/>
Topic: Consulting in Big Data challenges in Text Mining.
- June 2017 to date **Signal Maritime, Athens, Greece:** Signal Maritime is a commercial ship management company. A spin-off from Thenamaris Ships Management, a company that has been setting industry standards for approximately 40 years.
Topic: Consulting in Machine Learning challenges in Big Data.
- Dec. 2017 to date **OgilvyOne Worldwide, Athens, Greece:** OgilvyOne Worldwide Athens was established in 1987 and is part of the OgilvyOne Worldwide network, the world’s pre-eminent Customer Engagement Agency. OgilvyOne Athens has been named both Digital and Direct Agency of the Year in Greece for 2012, 2013, 2014, 2015 and 2016.
Topic: Consulting in Visualization and Data Mining.

PAST PROFESSIONAL EXPERIENCE

- 2011 **Development of the “Bureau of Career and Employment (BCE)” information system**, of the University of Central Greece within the framework of the Operational Programme “Education and Lifelong Learning” of the “National Strategic Reference Framework (NSRF) 2007 -2013”.

Duration 01-05-2011 to 31-08-2011

LIST OF PUBLICATIONS

REFEREED JOURNAL PUBLICATIONS

- [J1] S. Tasoulis, D. Tasoulis, and V. Plagianakos, “Enhancing principal direction divisive clustering,” *Pattern Recognition*, vol. 43, no. 10, pp. 3391–3411, 2010.
- [J2] S. Tasoulis, D. Tasoulis, and V. Plagianakos, “Random direction divisive clustering,” *Pattern Recognition Letters*, vol. 34, no. 2, pp. 131 – 139, 2013.
- [J3] S. Tasoulis, C. Doukas, V. Plagianakos, and I. Maglogiannis, “Statistical data mining of streaming motion data for activity and fall recognition in assistive environments,” *Neurocomputing*, vol. 107, no. 0, pp. 87–96, 2013.
- [J4] S. Tasoulis, I. Maglogiannis, and V. Plagianakos, “Fractal analysis and fuzzy c-means clustering for quantification of fibrotic microscopy images,” *Artificial Intelligence Review (AIRE)*, pp.1–17, 2013.
- [J5] I. Maglogiannis, S. Georgakopoulos, S. Tasoulis and V. Plagianakos, “A Software Tool for the Automatic Detection and Quantification of Fibrotic Tissues in Microscopy Images,” *Information Sciences*, vol. 308, pp. 125–139, 2015.
- [J6] L. Wang, S. Tasoulis, T. Roos and J. Kangasharju, “Kvasir: Scalable Provision of Semantically Relevant Web Content on Big Data Framework,” *IEEE Transactions on Big Data*, Special Issue on Big Data Analytics and the Web, vol. 2, no. 3, pp. 219–233, 2016.
- [J7] N. Pavlidis, D. Hofmeyr, and S. Tasoulis, “Minimum density hyperplanes”, *Journal of Machine Learning Research*, vol. 17, no. 156, pp. 1–33, 2016.
- [J8] Chantelle L. Mason, Joseph Leedale, Sotirios Tasoulis, Ian Jarman, Daniel J. Antoine, Steven D. Webb, “A systems toxicology approach to identifying paracetamol overdose”, *CPT: Pharmacometrics & Systems Pharmacology*, Vol. 7 no. 6, pp. 394–403, 2018.
- [J9] Joseph Leedale, Chantelle L. Mason, Sotirios Tasoulis, Ian Jarman, Steven D. Webb, “A systems toxicology paracetamol overdose framework: accounting for high-risk individuals”, *Computational Toxicology*, 2019, accepted, to appear.

REFEREED CONFERENCE PUBLICATIONS

- [C1] S. Tasoulis and D. Tasoulis, “Improving principal direction divisive clustering,” *14th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD 2008), Workshop on Data Mining using Matrices and Tensors, Las Vegas, USA*, 2008.
- [C2] S. Tasoulis, V. Plagianakos, and D. Tasoulis, “Projection based clustering at gene expression data,” *Computational Intelligence Methods for Bioinformatics and Biostatistics (CIBB 2009)*, Genova, Italy, 2009.
- [C3] S. Tasoulis, V. Plagianakos, and D. Tasoulis, “Projection based clustering of gene expression data,” *Lecture Notes in Computer Science (LNCS, volume 6160)*, Springer, 2009, pp. 228–239.
- [C4] S. Tasoulis, C. Doukas, I. Maglogiannis, and V. Plagianakos, “Classification of dermatological images using advanced clustering techniques,” in *Engineering in Medicine and Biology Society (EMBC), 2010 Annual International Conference of the IEEE*. IEEE, 2010, pp. 6721–6724.
- [C5] S. Tasoulis, C. Doukas, I. Maglogiannis, and V. Plagianakos, “Classification of apoptosis using advanced clustering techniques on digital microscopic images,” in *Engineering in Medicine and Biology Society (EMBC), 2010 Annual International Conference of the IEEE*. IEEE, 2010, pp. 5565–5568.
- [C6] S. Tasoulis, C. Doukas, I. Maglogiannis, and V. Plagianakos, “Skin lesions characterisation utilising clustering algorithms,” in *Artificial Intelligence: Theories, Models and Applications*. Springer, 2010, pp. 243–253.
- [C7] S. Tasoulis, D. Tasoulis, and V. Plagianakos, “Evolutionary principal direction divisive partitioning,” in *IEEE Congress on Evolutionary Computation (CEC)*. IEEE, 2010, pp. 1–7.
- [C8] S. Tasoulis, V. Plagianakos, and D. Tasoulis, “Independent component divisive clustering of gene expression data,” in *Eighth International Meeting on Computational Intelligence Methods for Bioinformatics and Biostatistics (CIBB 2011)*, Gargnano-Lago di Garda, Italy, 2011.

- [C9] S. Tasoulis, D. Tasoulis, and V. Plagianakos, "Clustering of high dimensional data streams," in *Artificial Intelligence: Theories and Applications*. Springer, 2012, pp. 223–230.
- [C10] S. Tasoulis, C. Doukas, I. Maglogiannis, and V. Plagianakos, "Statistical data mining of streaming motion data for fall detection in assistive environments," in *Engineering in Medicine and Biology Society, EMBC, 2011 Annual International Conference of the IEEE*. IEEE, 2011, pp. 3720–3723.
- [C11] S. Tasoulis, C. Doukas, I. Maglogiannis, and V. Plagianakos, "Independent component clustering for skin lesions characterization," in *Artificial Intelligence Applications and Innovations*. Springer, 2011, pp. 472–482.
- [C12] S. Tasoulis, M. Epitropakis, V. Plagianakos, and D. Tasoulis, "Density based projection pursuit clustering," in *IEEE Congress on Evolutionary Computation (CEC)*. IEEE, 2012, pp. 1–8.
- [C13] S. Tasoulis, I. Maglogiannis, and V. Plagianakos, "Unsupervised detection of fibrosis in microscopy images using fractals and fuzzy c-means clustering," in *Artificial Intelligence Applications and Innovations*. Springer Boston, 2012, pp. 385–394.
- [C14] S. Georgakopoulos, S. Tasoulis, V. Plagianakos and I. Maglogiannis, "Artificial Neural Networks and Principal Components Analysis for Detection of Idiopathic Pulmonary Fibrosis in Microscopy Images," in *14th International Conference on Engineering Applications of Neural Networks (EANN2013)*. Springer Berlin Heidelberg, 2013, pp. 292–301.
- [C15] S. Tasoulis, L. Cheng, N. Välimäki, N. Croucher, S. Harris, W. Hanage, T. Roos and J. Corander, "Random Projection Based Clustering for Population Genomics," in *IEEE International Conference on Big Data (IEEE BigData 2014)*, Oct 27-30, Washington DC, USA, 2014, pp. 675 - 682.
- [C16] L. Wang, S. Tasoulis, T. Roos and J. Kangasharju, "Kvasir: Seamless Integration of Latent Semantic Analysis-Based Content Provision into Web Browsing," *24th International World Wide Web Conference*, 24th International World Wide Web Conference (WWW), 2015.
- [C17] S. Georgakopoulos, S. Tasoulis and V. Plagianakos, "Efficient Change Detection for High Dimensional Data Streams," in *IEEE International Conference on Big Data (IEEE BigData 2015)*, Oct 29, Santa Clara CA, USA, 2015, pp. 2219 - 2222.
- [C18] Yang, S. Tasoulis and T. Ross, "Manifold Visualization via Short Walks," in *Eurovis 2016*, The Eurographics Association, 6-10 June 2016, Groningen, Netherlands.
- [C19] V. Hyvnen, T. Pitknen, S. Tasoulis, E. Jsaari, R. Tuomainen, L. Wang, J. Corander, and T. Roos. "Random Projections and Voting for Approximate Nearest Neighbor Search," in *IMA Conference on the Mathematical Challenges of Big Data*, 1-2 December 2016, Mary Ward House, London, UK. (abstract submission)
- [C20] Raúl Casana-Eslava, Sotiris Tasoulis, Ian H. Jarman, Paulo J. G. Lisboa, José D. Martin-Guerrero. "Quantum clustering of high-dimensional data," in *IMA Conference on the Mathematical Challenges of Big Data*, 1-2 December 2016, Mary Ward House, London, UK. (abstract submission)
- [C21] V. Hyvnen, T. Pitknen, S. Tasoulis, E. Jsaari, R. Tuomainen, L. Wang, J. Corander, and T. Roos. "Fast nearest neighbor search through sparse random projections and voting," in *2016 IEEE International Conference on Big Data (IEEE Big Data 2016)*, Dec 5-8, Washington DC, USA, pages 881–888.
- [C22] S. Georgakopoulos, S. Tasoulis, A. Vrahatis and V. Plagianakos. "Convolutional Neural Networks for Toxic Comment Classification," *Hellenic Conference on Artificial Intelligence (SETN 2018)*.
- [C23] S. Tasoulis, A. Vrahatis, S. Georgakopoulos, and V. Plagianakos. "Real Time Sentiment Change Detection of Twitter Data Streams," in *2018 IEEE International Conference on INnovations in Intelligent SysTems and Applications (IEEE (SMC) INISTA 2018)*.
- [C24] SK Tasoulis, AG Vrahatis, SV Georgakopoulos, VP Plagianakos. "Biomedical Data Ensemble Classification using Random Projections", 2018 IEEE International Conference on Big Data (Big Data), 166-172
- [C25] SK Tasoulis, AG Vrahatis, SV Georgakopoulos, VP Plagianakos. "Visualizing High-dimensional single-cell RNA-sequencing data through multiple Random Projections", 2018 IEEE International Conference on Big Data (Big Data), 5448-5450
- [C26] SV Georgakopoulos, SK Tasoulis, AG Vrahatis, VP Plagianakos. "Convolutional Neural Networks for Twitter Text Toxicity Analysis", 2019 INNS Big Data and Deep Learning conference, 370-379
- [C27] Sotiris K Tasoulis, Georgios I Mallis, Spiros V Georgakopoulos, Aristidis G Vrahatis, Vassilis P Plagianakos, Ilias G Maglogiannis. "Deep Learning and Change Detection for Fall Recognition", 2019 International Conference on Engineering Applications of Neural Networks, 262-273

SUBMITTED ARTICLES

- [A1] S. Tasoulis, N. Pavlidis and T. Roos, "Nonlinear Dimensionality Reduction for Clustering", Pattern Recognition, 2019.

SOFTWARE PACKAGES

- [P1] **Open Source Clustering Toolbox** for the MATLAB environment and R project containing clustering algorithms capable of dealing with ultra high dimensional data, <https://sites.google.com/site/sotiristasoulis/software>.
- [P1] **Open Source Visualization Toolbox** for the MATLAB environment containing algorithms for visualizing low-dimensional non-linear manifolds underlying high-dimensional data. <https://sites.google.com/site/sotiristasoulis/software>.
- [P2] **Kvasir: A Semantic Recommendation System**. Build on top of latent semantic analysis and other state-of-art technologies to seamlessly integrate an automated and proactive content provision service into web browsing, <http://www.cs.helsinki.fi/u/lxwang/kvasir/>.

COMPUTING SKILLS

OPERATING SYSTEMS:

Expert in Linux-based and Unix-based OS, MicrosoftTM Windows OS (95, 98, 2000, NT, 2003, XP, Vista, 7), MS DOS.

PROGRAMMING LANGUAGES:

Expert MATLABTM, Octave, R

Basic Knowledge C/C++, Bash Scripting, FORTRAN 77/90/95, Assembly 8088 family, SPSSTM

OFFICE AUTOMATION

Expert in L^AT_EX, Microsoft OfficeTM Suite

ACADEMIC REFERENCES

Petri Myllymäki, Professor

CONTACT: Complex Systems Computation Group Helsinki Institute for Information Technology P.O.Box 68 (Department of Computer Science) FIN-00014 University of Helsinki, Finland
✉ : Petri.Myllymaki@cs.helsinki.fi ☎ : +358 2941 51337 ☎ : +358 9 191 51120

Teemu Roos, Associate Professor

CONTACT: Department of Computer Science and Helsinki Institute for Information Technology HIIT Exactum building, A322 PO Box 68 FI-00014 University of Helsinki Finland
✉ : teemu.roos@cs.helsinki.fi

Paulo Lisboa, Professor (Head of Department)

CONTACT: Department of Applied Mathematics, Faculty of Engineering and Technology, Liverpool John Moores University, UK. James Parsons Building 3 Byrom Street Liverpool Merseyside L3 3AF
✉ : P.J.Lisboa@ljmu.ac.uk ☎ : +44 0151 231 2225