

## Education

- 2019 **PhD**, *Multimedia Signal Processing and Communications*, Universidad Carlos III de Madrid.  
Signal Processing Group, Department of Signal Theory and Communications.  
*Thesis*: Sequential and adaptive Bayesian computation for inference and optimization  
*Supervisor*: Joaquín Míguez.
- 2012 **MSc**, *Communications Engineering*, Istanbul Technical University.  
*Thesis*: A structured sparse decomposition method for audio signals
- 2010 **BSc**, *Communications Engineering*, Istanbul Technical University.  
*Thesis*: Anisotropic diffusion in image processing

## Work Experience

- 2021 – **Research Associate**, The Alan Turing Institute, UK.  
*Working with Mark Girolami, as a part of the Computational Statistics and Machine Learning (CSML) group at University of Cambridge.*
- 2019 – 2021 **Research Fellow**, University of Warwick, UK.  
*joint appointment between Dept. of Computer Science and Dept. of Statistics, based at The Alan Turing Institute, London, working within the London Air Quality project, led by Theodoros Damoulas.*
- 2015 – 2019 **Research Assistant**, Carlos III University of Madrid, Spain.  
*within the Signal Processing Group (GTS), Dept. of Signal Theory and Communications.*
- June - August 2018 **Visiting Researcher**, The Alan Turing Institute, London, UK.  
*within the programme Data-Centric Engineering, hosted by Chris Oates.*
- May - June 2018 **Visiting Research Scientist**, Fraunhofer Heinrich-Hertz Institute (HHI), Berlin, Germany.  
*within the Signal and Information Processing Group, hosted by Zoran Utkovski.*
- Jan. - March 2018 **Visiting Researcher**, Imperial College London, UK.  
*under the supervision of Dan Crisan, Department of Mathematics.*
- August 2017 **Visiting Research Scientist**, Fraunhofer Heinrich-Hertz Institute (HHI), Berlin, Germany.  
*within the Signal and Information Processing Group, hosted by Zoran Utkovski.*
- 2012 – 2015 **Research Assistant**, Boğaziçi University.  
*under the supervision of A. Taylan Cemgil with Statistical Inference Group.*
- 2014 – 2015 **Quantitative Researcher**, alqosis inc.  
*worked on algorithmic trading, portfolio optimization, time-series analysis.*
- 2010 – 2012 **Research Assistant**, Istanbul Technical University.  
*within the Multimedia Signal Processing and Pattern Recognition Group.*

## Teaching/Supervision Experience

- Supervision *Ayman Boustati*, co-supervised with Theodoros Damoulas

- Fall 2018 **Teaching Assistant**, Systems and Signals, in Dept. of Signal Theory and Communications, Universidad Carlos III de Madrid.
- 2013 – 2015 **Teaching Assistant** (Voluntary), Boğaziçi University, Istanbul, Turkey.  
 Monte Carlo methods (graduate course)  $\times 3$   
 Bayesian statistics and machine learning (graduate course)  $\times 2$

## Papers

- 2021 *Probabilistic sequential matrix factorization*, **Ö. D. Akyildiz\***, G. J.J. van den Burg\*, T. Damoulas, M. J. Steel. *AISTATS 2021*.
- 2020 *VarGrad: A Low Variance Gradient Estimator for Variational Inference*, L. Richter, A. Boustati, N. Nuesken, F. J. Ruiz, **Ö. D. Akyildiz**. *NeurIPS* (2020).
- 2020 *Generalized Bayesian Filtering via Sequential Monte Carlo*, A. Boustati\*, **Ö. D. Akyildiz\***, T. Damoulas, A. M. Johansen, *NeurIPS* (2020).
- 2020 *Convergence rates for optimised adaptive importance samplers*, **Ö. D. Akyildiz**, J. Miguez, *Statistics and Computing*, to appear.
- 2020 *Parallel sequential Monte Carlo for stochastic gradient-free nonconvex optimization*, **Ö. D. Akyildiz**, D. Crisan, J. Miguez, *Statistics and Computing*, to appear.
- 2020 *Nonasymptotic analysis of Stochastic Gradient Hamiltonian Monte Carlo under local conditions for nonconvex optimization*, **Ö. D. Akyildiz**, S. Sabanis, arXiv:2002.05465.
- 2020 *Nudging the particle filter*, **Ö. D. Akyildiz**, J. Míguez, In *Statistics and Computing*, 30, 305–330.
- 2019 *Nonasymptotic estimates for Stochastic Gradient Langevin Dynamics under local conditions in nonconvex optimization*, Y. Zhang, **Ö. D. Akyildiz**, T. Damoulas, S. Sabanis, arXiv:1910.02008.
- 2019 *A probabilistic incremental proximal gradient method*, **Ö. D. Akyildiz**, É. Chouzenoux, V. Elvira, J. Miguez, In *IEEE Signal Processing Letters*.
- 2019 *Dictionary filtering: a probabilistic approach to online matrix factorisation*, **Ö. D. Akyildiz**, J. Miguez, *Signal, Image and Video Processing*, June 2019, 13(4):737-744.
- 2018 *The Incremental Proximal Method: A Probabilistic Perspective*, **Ö. D. Akyildiz**, V. Elvira, J. Miguez, *ICASSP* 2018.
- 2017 *A probabilistic interpretation of replicator-mutator dynamics*, **Ö. D. Akyildiz**, arXiv:1712.07879, 2017.
- 2017 *Adaptive noisy importance sampling for stochastic optimization*, **Ö. D. Akyildiz**, I. P. Marino, J. Miguez, *IEEE CAMSAP* 2017.
- 2016 *On the Relationship between Online Optimizers and Recursive Filters*, **Ö. D. Akyildiz**, V. Elvira, J. Fernandez-Bes, J. Miguez, *NeurIPS Workshop on Optimizing the Optimizers*, Barcelona, Spain, 2016.
- 2015 *Matrix Factorisation with Linear Filters*, **Ö. D. Akyildiz**, arXiv:1509.02088.
- 2015 *Online Matrix Factorization via Broyden Updates*, **Ö. D. Akyildiz**, Preprint, arXiv:1506.04389.
- 2014 *Primal-Dual Algorithms for Audio Decomposition Using Mixed Norms*, İ. Bayram, **Ö. D. Akyildiz**, *Journal of Signal, Image and Video Processing*, 2014.
- 2012 *An Analysis Prior Based Decomposition Method for Audio Signals*, **Ö. D. Akyildiz** and İ. Bayram, *EUSIPCO* 2012.

## Talks

- Sep. 17, 2020 *Nudging the particle filter*, for the SMC Interest Group at the University of Warwick.
- May 20, 2020 *An overview of nonasymptotic analysis for the stochastic gradient Markov chain Monte Carlo*, at the Turing DCE Reading Group.
- Oct. 30, 2019 *Proximal methods from a probabilistic perspective*, at *ProbNum 2019* at the Turing.
- Sep. 16, 2019 *Convergence rates for optimised adaptive importance samplers* (Invited), U. of Edinburgh.
- May 10, 2019 *Probabilistic Incremental Optimization* (Invited), University of Warwick.
- Dec. 20, 2018 *Parallel SMC for stochastic optimization* (Invited), Bogazici University.
- Sep. 25, 2018 *Nudging the particle filter*, Universidad Carlos III de Madrid.
- Feb. 16, 2018 *Nudging the particle filter* (Invited), Imperial College London.
- Nov. 28, 2017 *Adaptive noisy importance sampling*, Universidad Carlos III de Madrid.

## Professional Activities

- Reviewer NeurIPS 2020, ICML 2020, AISTATS 2021, IEEE Transactions on Signal Processing; IEEE Signal Processing Letters; Digital Signal Processing; ECML 2020.

## Visits & Workshops

- 16–19/9/19 School of Mathematics, University of Edinburgh, Edinburgh, UK.
- 18–23/8/19 School of Mathematics, University of Edinburgh, Edinburgh, UK.
- 27–31/8/18 Bayesian Computation for High-Dimensional Statistical Models, Singapore.
- 26–28/3/18 BayesComp 2018, Barcelona, Spain.
- 29/8–1/9/17 SMC 2017 Workshop, Uppsala, Sweden (Poster).
- 5–10/12/16 NIPS Conference, Barcelona, Spain.
- 3–4/12/16 European Workshop on Reinforcement Learning, Barcelona.
- 26–29/6/16 IEEE Workshop on Statistical Signal Processing, Palma, Spain.
- 16–20/5/16 School of Mathematical Sciences, Queen Mary University of London, UK.
- 1–5/2/16 School of Mathematical Sciences, Queen Mary University of London, UK.
- 14–24/12/15 School of Mathematical Sciences, Queen Mary University of London, UK.
- 21–23/12/15 Sequential Monte Carlo Workshop, Imperial College London, UK.

## Graduate Schools

- 19–23/6/17 *Dobbiaco Summer School on Probabilistic Numerics*, Dobbiaco, Italy.
- 4–8/7/16 *Summer School on Uncertainty Quantification for Applied Problems*, Basque Center for Applied Mathematics, Bilbao, Spain.
- 13–24/7/15 *Machine Learning Summer School*, Max Planck Institute of Intelligent Systems, Tübingen, Germany. (awarded full financial support.)
- 22–26/6/15 *Foundations and Advances in Stochastic Filtering*, Barcelona, Spain.