

Katerina Kosta

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Key Skills

Machine learning | Time series analysis | Music information retrieval

Python, PyTorch, TensorFlow, scikit-learn, GitHub, TDD, LaTeX

Work Experience

Senior Machine Learning researcher AI lab: Sound, Audio and Music Intelligence team BYTEDANCE/TIKTOK

April 2019 - Present

- Implemented end-to-end machine learning/deep learning models in the audio and symbolic music domain.
- Designed and executed product-driven research.
- Presented results to stakeholders and external teams.
- Built containerised applications and web interfaces for demonstrations.
- Filed two patents for innovative algorithms and submitted an accepted paper at ISMIR 2021 (to be published).
- Delivered presentations to research labs and conferences (including a [tutorial](#) at ISMIR 2019 on Computational Modeling of Musical Expression).
- Mentored an intern which resulted in a full-time hire.
- Worked as part of a distributed team between the UK, US and China.

Machine Learning Researcher JUKEDECK

February 2016 - April 2019

- Designed and ran experiments to improve the core deep compositional models.
- Gathered, cleaned and processed training data.
- Directly managed an intern focused on audio processing research.
- Delivered presentations to research labs and conferences (including a keynote speech at the International Conference of Computational Creativity, 2018).
- Used industry best practices throughout, including pairing, testing and code reviewing.

**Research Intern
Intelligent Music System Group R&D
YAMAHA**

October 2015 - December 2015

- Worked on a project aiming to re-create a piano recording on a Yamaha disklavier (more details about the project [here](#)).
- Built a machine learning system for estimating note velocities from audio, based on non-negative matrix factorisation and source separation techniques.

Education

**Ph.D. Electronic Engineering and Computer Science
Centre for Digital Music, Queen Mary University of London**

2012 - 2016

- Principal's Interdisciplinary Full Scholarship.
- Thesis: "Computational Modelling and Quantitative Analysis of Dynamics in Performed Music", Supervisors: Prof. Elaine Chew, Dr. Oscar F. Bandtlow.
- Published work related to machine learning techniques for prediction and classification tasks for analysing and modelling expressiveness in music performance.
- Developed algorithms for time series analysis.
- Teaching Assistant for several undergraduate courses.

**MSc. Sound and Music Computing
Music Technology Group, Universitat Pompeu Fabra, Barcelona**

2010 - 2011

- Thesis: "Unsupervised Generation of Chord Sequences from a Sound Example".
- Created an unsupervised learning system that generates a sound sequence from an original audio chord sequence, leading to a top-tier conference publication.

**BSc. Mathematics
National and Kapodistrian University of Athens, Greece**

2004 - 2010

- Specialised in applied mathematics.

**Music
Filippos Nakas Conservatory, Athens, Greece**

2005 - 2010

- Diploma in classical piano.
- Music theory studies.
- Member of chamber music groups and choirs.

Publications

Medeot, G., Cherla, S., Kosta, K., McVicar, M., Abdallah, S., Selvi, M., Newton-Rex, E., & Webster, K. (2021). A method of generating music data. US Patent App. 16/967,064. ([link](#))

Medeot, G., Cherla, S., Kosta, K., McVicar, M., Abdallah, S., Selvi, M., Newton-Rex, E., & Webster, K. (2018). StructureNet: Inducing Structure in Generated Melodies. In Proceedings of the 19th International Society for Music Information Retrieval Conference (ISMIR), pp. 725-731, Paris, France. ([link](#))

Kosta, K., R. Ramirez, O. F. Bandtlow, E. Chew (2016). Mapping between dynamic markings and performed loudness: A machine learning approach. Journal of Mathematics and Music, 10(2): 149-172. ([link](#))

Kosta, K., O. F. Bandtlow, E. Chew (2018). Dynamics and relativity: Practical implications of dynamic markings in the score. Journal of New Music Research, 47(5): 438-461. ([link](#))

Kosta, K. (2017). Computational Modelling and Quantitative Analysis of Dynamics in Performed Music. Ph.D. Thesis. Centre for Digital Music, Queen Mary University of London, London, UK. ([link](#))

Kosta, K., O. F. Bandtlow, E. Chew (2018). MazurkaBL: Score-aligned loudness, beat, and expressive markings data for 2000 Chopin Mazurka recordings. In Proceedings of the 4th International Conference on Technologies for Music Notation and Representation (TENOR), pp. 85-94, Montreal, Canada. ([link](#))

Kosta, K., O. F. Bandtlow, E. Chew (2017). Dynamic change points in music audio capture dynamic markings in score. 18th International Society for Music Information Retrieval Conference (ISMIR), Late-Breaking and Demo Session, Suzhou, China. ([link](#))

Kosta, K., O. F. Bandtlow, E. Chew (2016). Outliers in Performed Loudness Transitions: An Analysis of Chopin Mazurka Recordings. In Proceedings of the 14th International Conference for Music Perception and Cognition (ICMPC), pp. 601-604, July 5-9, 2016, San Francisco, California, USA. ([link](#))

Kosta, K., R. Ramirez, O. F. Bandtlow, E. Chew (2015). Predicting loudness levels and classifying dynamic markings in recorded music. In Proceedings of 8th International Workshop on Machine Learning and Music (MML2015), Machine Learning for Music Generation, Vancouver, Canada. ([link](#))

Kosta, K., O. F. Bandtlow, E. Chew (2015). A Change-point Approach Towards Representing Musical Dynamics. In T. Collins, D. Meredith, A. Volk (eds.): Mathematics and Computation in Music: 5th International Conference, MCM 2015, London, UK, June 22-25, 2015, Proceedings, pp. 179-184, Lecture Notes in Computer Science 9110, Berlin: Springer. ([link](#))

Kosta, K., Li, S. (2014). 2013 Performance Studies Network International Conference. Computer Music Journal, 38(2): 78-80. ([link](#))

Kosta, K., O. F. Bandtlow and E. Chew (2014). A Study of Score Context-dependent Dynamics in Piano Performance (abstract). In Proceedings of the Performance Studies Network International Conference (PSN3), Jul 17-20, Cambridge, UK. ([link](#))

Kosta, K., O. F. Bandtlow, E. Chew (2014). Practical Implications of Dynamic Markings in the Score: Is piano always piano? In Proceedings of the 53rd Audio Engineering Society (AES) Meeting on Semantic Audio, Jan 26-29, London, UK. ([link](#))

Kosta, K., Y. Song, G. Fazekas, M. Sandler (2013). A Study of Cultural Dependence of Perceived Mood in Greek Music. In Proceedings of the 14th International Society for Music Information Retrieval (ISMIR), pp. 317-322, Nov 4-8, Curitiba, Brazil. ([link](#))

Kosta, K., M. Marchini, H. Purwins (2012). Unsupervised Chord-Sequence Generation from an Audio Example. In Proceedings of the 13th International Society for Music Information Retrieval (ISMIR), pp. 481-486, Porto, Portugal. ([link](#))