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## CS-Colloquium

# Machine Learning Meets Classical Music

mit **Ass.-Prof. Dr. Andreas Arzt** (Johannes Kepler Universität Linz)

**Wann?** 14. März, 09:00

**Wo?** Seminarraum 8 (SR8), Fakultät für Informatik  
Währinger Straße 29  
1090 Wien

### Abstract

Music is a fascinating domain and offers endless opportunities for developing, testing, and applying signal processing and machine learning techniques. In this talk, I will focus on the topic of music tracking, which is concerned with algorithms that “listen” to a live performance of a musician and “read” along in the sheet music.

First, I will present a robust and mature music tracking system based on traditional feature engineering and sequence alignment methods. This system is capable of following expressive piano music and complex orchestral music. We have used this system on a number of occasions live on stage, the most memorable one being a live tracking experiment at the venerable Concertgebouw in Amsterdam, where it flawlessly followed a performance of the Alpensinfonie by Richard Strauss and was used to synchronise live visualisation to the music.

I will then analyse the limitations and weaknesses of this system, and discuss how we tried to solve these problems. This involves research on music transcription (supervised learning, multi-target learning), transposition-invariant features (unsupervised learning, feature learning), and how to directly match audio streams and the sheet music images without intermediate representations (deep multi-modal machine learning).

The talk will conclude with a brief discussion of my future research plans in the field of intelligent music processing, which for me is a beautiful object of study and a wonderful playground for machine learning research.