

In our study we deal with various stages of human cognition of real-life musical signals, create their models and discuss their implementation. The first part compares time-frequency representations and their factorization into sinusoids and background noise. We combine various approaches to coupling sinusoids into trajectories. Next we examine methods for the estimation of note parameters from trajectories and methods for musical instrument classification. The final part focuses on global music-theoretical features of recordings such as tempo, melodic phrases, chord accompaniment or key.