Proposition de recherche doctorale

Probabilistic latent variable analysis for automatic music transcription

Mots clés :

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- Unité de recherche : Sciences et Technologies de la Musique et du Son
- Ecole doctorale : École Doctorale Informatique, Télécommunications, Électronique de Paris
- Domaine scientifique principal: Divers

Résumé du projet de recherche (Langue 1)

Introduction} The automatic transcription of a piece of music consists of deriving a midi score that contains sufficient information to replay the original piece of music with a midi synthesiser. Recent research results have allowed making considerable progress towards this goal without however coming close to a complete solution. A multitude of algorithms are available that solve the important underlying sub-problems: polyphonic pitch estimation (Yeh, et al., 2010; Dressler, 2014), and note onset detection (Roebel, 2003; Boeck, et al. 2012). And recently a new probabilistic interpretation for nonnegative decomposition emerged und the term termed probabilistic latent component analysis (PLCA) (Shashanka et al. 2008). The probabilistic interpretation allows for straightforward integration of prior information and already has been used for automatic transcription with very promising results in (Benetos, 2012; Grindlay et al; 2015).

Résumé du projet de recherche (Langue 2)

Description of Work} In this context we propose to investigate into the automatic transcription of instrumental music using PLCA. The desired output is the midi notation including note onsets, pitches and instrument. The general idea is to increase the efficiency and reliability of the PLCA algorithm by means of adding additional priors and constraints that are derived by means independent analysis algorithms and inherent musical constraints. As starting point of the thesis there are the following sources of information that should be taken into account: -# Onset detection: State of the art onset detectors are computationally very efficient achieving at the same time a relatively high accuracy. The onset detection results should be integrated into he PLCA framework in terms of onset priors. -# Pitch priors: Numerous simple score base pitch priors should be integrated with the aim to improve the computational efficiency of the PLCA. -# Number of instruments: The number of instruments is an important information that constraints the number of instrument templates that are available for decomposition for each fundamental frequency. Additional constraints should be defined, integrated into the PLCA framework and evaluated.

Informations complémentaires (Langue 2)