## Thesis Abstract

No.		

Registration	□ "KOU"	□ "OTSU"	Namai	Endrjukaite Tatjana
Number:	No.	*Office use only	Name:	

Title of Thesis:

Emotion Identification System for Musical Tunes based on Acoustic Signal Data

## Summary of Thesis:

Music plays an important role in the human's life. It is not only a set of sounds — music evokes emotions subjectively perceived by listeners. The growing amount of audio data wakes up a need for content-based searching. Traditionally, tunes information has been retrieved based on reference information, for example, the title of a tune, the name of an artist, the genre and so on. When users would like to try to find music pieces in a specific mood such standard reference information of the tunes is not sufficiently effective. We need new methods and approaches to realize emotion-based search and tune content analysis.

This thesis proposes a new music-tune analysis approach to realize automatic emotion identification by means of intrinsic musical features. The innovativeness of this research is that it uses new musical features for tune's analysis, which are based on human's perception of the music. Three significant approaches are introduced for calculation of essential features of emotional aspects of music pieces. By means of these approaches the primary musical characteristics can be expressed. These are repeated parts of a tune, thumbnail of a tune, and internal homogeneity pattern. At the heart of the system described in this research, the innovative algorithm to process non-stationary signal data was introduced for audio signals processing in particular. Moreover, this research describes a new way of automatic emotion processing, calculation and presentation on a plane, which has the key idea to quantitatively measure emotions without categorizations.

Finally, this thesis describes the overall architecture of the tunes emotion recognition system, as well as discusses details for specific applications including tunes querying by emotion, querying by tune, and playlist suggestion. We also describe an evaluation section where the proposed approach is tested and then is compared to other researches. Most important distinctions of the proposed approach are that it includes broader range of tunes genres, which is very significant for music emotion recognition system. Emotion description on continuous plane instead of categories also results in more supported adjectives for emotion description which is also a great advantage.

**Keywords:** music analysis, music emotions, emotion recognition, music similarity, instantaneous frequency spectrum, tune internal homogeneity, music repetitions.