UNC CHARLOTTE

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Automatic Music Mood Tagger
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I. Research Overview and Outcome

Research Problem

There is an increasing demand for ways to automatically tag music by mood or emotions. In particular, personalized tagging is essential in a subjective field such as music. Different music makes different people happy, sad, etc. Our goal was to create a program which would interface with a user's music program, allows the user to tag the currently playing song, and learns the user's tagging behavior.

Methodology

Using in-house technology from the Music Technology Group at UPF (Essentia for extracting features from music, Gaia for creating models), statistical features were extracted from an initial set of songs selected to represent each of the possible tagged emotions; happy, sad, angry, and peaceful. To this effect, each song has been annotated with a binary tag indicating a given emotion for each training dataset (e.g. songs in the happy training set are tagged as "happy" or "not happy"). This initial feature extraction was used to train binary SVM classifiers for each emotion.

The program then interfaces with the user's current music program, showing the current title and artist. This allows the user to tag the song that's currently playing with the emotions they feel fit the song. The program will also attempt to tag the song with a set of emotions, based on the currently trained SVM. The user can tag additional moods, or remove any of the tags selected by the program. Anytime the user selects a set of tags different from what the system selects, the SVMs for the emotion tags involved are retrained. For example, if the system tags a song as being Happy and Peaceful, but the user wants the song to be tagged as Sad and peaceful, he can uncheck the Happy tag and check the Sad tag. Then the system will retrain the Happy SVM so that the song is listed as "not Happy", and retrain the Sad SVM so that the song is listed as "Sad". Through this retraining of SVMs, the system continually learns the user's behavior.

Outcome

The tagger is being tested by a limited number of people at the moment for its effectiveness. At present, it does seem to be able to learn someone's tagging behavior, but we still do not know how effective it will be long term. We have presented this work at a late-breaking demo session for the International Society of Music Information Retrieval (ISMIR) 2011 conference in Miami, FL and are working toward creating a full paper to be presented either at a conference or in a journal.
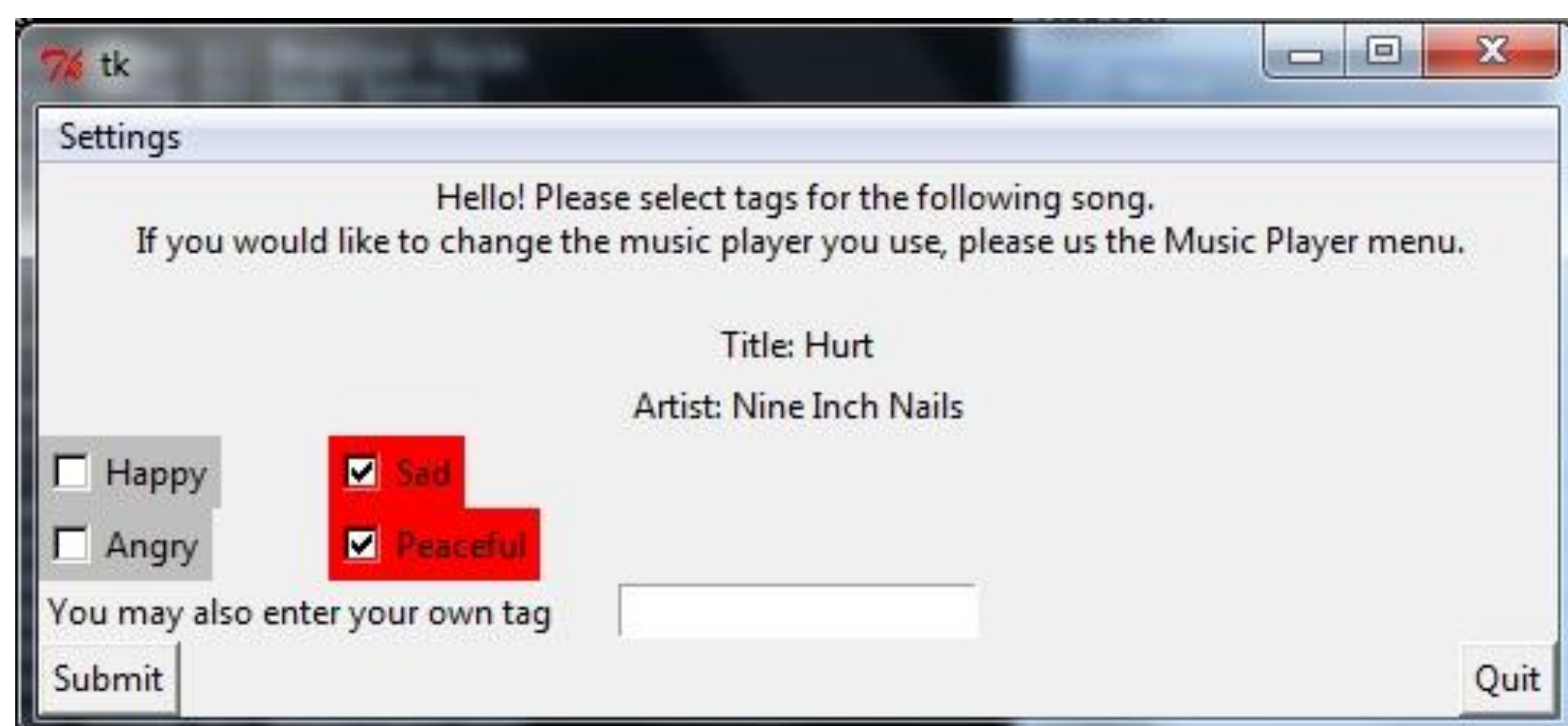
Music player gets to "Hurt" by Nine Inch Nails (red indicates tags that the system selects itself)
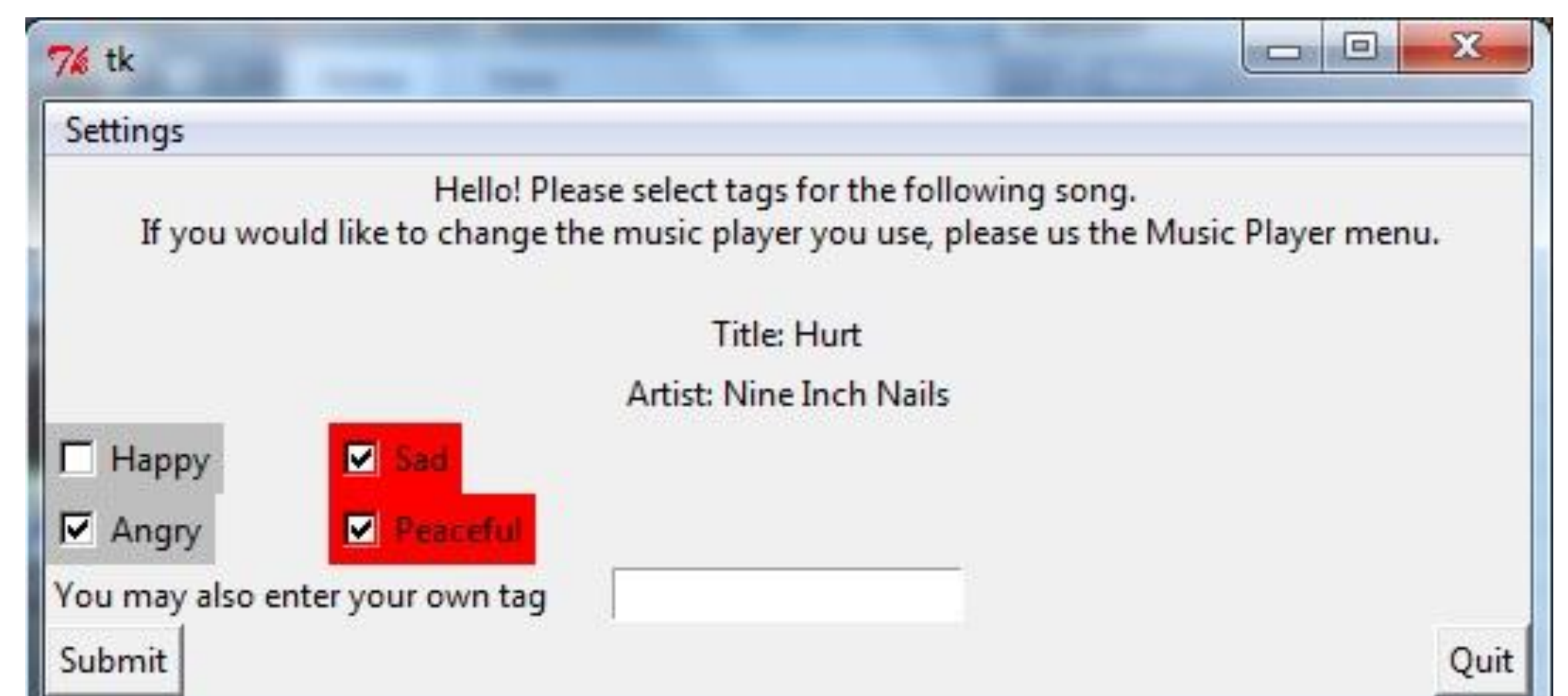
The user then decides to add the tag "Angry" and hit the Submit button

The next time the player plays "Hurt", the submitted tags are shown (grey indicates user-selected tags)

II. International Experience

I had never been outside of continental North America before this trip, so Barcelona was an incredibly new experience. I didn't know Spanish, which created some difficulty, but I was still able to go to some great places. Sagrada Famillia, Mont Juic, Monserrat, Tibidabo, and I lived within walking distance of Barceloneta and the Arc de Triomf. I also went to Amsterdam for a few days and saw the Oudekerk, the Anne Frank house, and the canals. This experience has been very valuable to me personally and professionally. Professionally, working with the Music Technology Group has given me valuable knowledge and connections within the MIR community which will help me greatly in my professional life. Personally, being outside the US has strengthened my worldview and given me greater perspective..

III. Acknowledgement