

Combining the Power of Crowd and Knowledge of Experts in GWAP

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There are many problems in all areas of science needing human interaction in order to be solved – such problems cannot be solved accurately solely by computers. Games with a purpose (“*GWAP*”) are great tool for exploitation of crowd for very low cost. With fun as a motivation factor, people are willing to interact with the system and (even unknowingly) generate necessary data.

After relative success of such game - *City Lights*¹ - which was able to rule out wrong user-created music tags, we realized that utilization of expert players is being suppressed in favour of crowd judgement which might be very costly when it comes to effective data acquisition. Experts are able to generate data which most of crowd is simply not able to, but when compared with crowd’s opinion, expert’s opinion just seems to be wrong and is ruled out.

In our work we would like to face this problem and focus on:

- Discovery of experts in crowds in order to acquire accurate metadata.
- Realization of game with a purpose focused on music using expert’s opinion to detect unseen - not obvious according to metadata - connections between songs.

In song relation discovery (hence also in music recommending systems) there are three types of discovery being used (and combined) [1]:

1. *Usage-based discovery* considering only listening habits of monitored user.
2. *Social-based discovery* considering listening habit and recommendations of user’s socially close people.
3. *Content-based discovery* considering only data generated from audio analysis and valid metadata.

In the past people were dependent on record store clerks and radio DJs in order to discover new songs they might like [1]. After huge growth of digital libraries people

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¹ <http://citylights.rootpd.com>

moved on the Web and depend mostly on online recommendation. By discovering experts in crowd, we would like to restore mentioned “musical authorities” and facilitate them into the online world.

The expert discovery in our game will be based purely on fact questioning and player’s listening history. Players will be listening to stream of music – the Internet radio - which is currently still very important source of music discovery among people [2]. We would like to target group of people who listen to radio while working and persuade them to play from time to time when song they like is being aired. If we sufficiently determine listener’s knowledge domain, we could encourage him to play if the song from his knowledge domain is being aired – which could be motivating as player should collect more points than usually.

Players will be given tasks relevant to song being streamed. Game will prepare questions for players (e.g. picking correct album cover, ordering of lyrics, rhythm repetition) which do have only one correct answer – hence we are able to determine correctness of player’s answer very accurately. By real time evaluation of player’s answers/actions and comparison with other players, we should be able to determine the player with the best musical knowledge playing the game at the time.

In addition to fact questioning, players will have an option to choose (enter) a song/artist/album they think is related to currently playing song. Non-expert players decisions will be used to confirm strength of relation between songs; expert players actions will be used to discover non-obvious song relations which can be later offered to non-expert players for confirmation. Our method depends on assumption that experts are able to create non-obvious relation with high success rate – so there is no need to focus on its validation.

However knowing that musical taste among people differs, some form of validation/selection has to be implemented anyway. A form of betting system could solve the issue and be a motivation/fun factor as well.

By letting players to create musical playlists we not only might discover relations between two songs, but also between ordered set of songs and (if implemented correctly) also be able to name the relation as well. Expert finding is field mostly used in enterprise systems and to our knowledge had not been applied in games with a purpose yet. In the near future we would like to analyse approaches used in enterprise knowledge systems and try to incorporate them into our game.

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References

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