Game Data Mining
Project Outline

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1 Project Description

The Game Data Mining major project aims to extract useful information from a video-game dataset. This is a research-centric project with some software deliverables developed to model the data. Originally based on a competition to model a dataset of the MMORPG '*Blade and Soul*', the project is now more open-ended due to the dataset no longer being available online.

Research using game datasets typically seeks to model player behaviour to maximise profitability of the game [1], to study human behaviour, or to test economic theory [2]. A study [3] of game log data from the MMORPG '*Lineage*' used social network analysis on in-game transactions (or *trades*) between players. The modelled data was then used to identify networks of black-market real-money trading (RMT).

This project proposes to use similar techniques to model economic data in other multiplayer games. In-game market data is available for the MMO '*EVE Online*' through an official web API [4]. This seems a good starting point for the project.

The models produced in this project will be visualised and evaluated, with comparison to related research.

2 Proposed Tasks

- **Project diary**—a record of the project's on-going development. Done in the form of a blog using the personal webpage provided by Aberystwyth University.
- **Research reading**—further reading of relevant research will likely be required to effectively progress in the project. May also influence the project's direction and methods.
- **Refining use of Agile techniques**—as the Agile methodology is not best suited to a research solo project, effectiveness of its techniques should be evaluated. Useful aspects of Agile more suited to this project should be identified early on.
- **Modelling the data**—application of chosen data mining techniques to produce a model of the data. Probably using Python with relevant libraries. Includes the use of test sets to produce a measure of accuracy.
- **Production of report**—final write-up of the project for hand-in. Will include further discussion and conclusion of the used techniques and produced models.

3 Project Deliverables

- **Datasets**—the datasets used in the project, after extracting the useful data. Will be produced at the start of the project, with potential modification to suit changing needs.
- **GitHub source control**—a GitHub [5] repository containing a backup of the project history. Mainly serving as a fail-safe to protect the work done. This should be set up at the start of the project and used throughout to track changes in the project deliverables.
- **Data models**—the software developed to represent the data, and its output. Will be started following acquirement of a suitable dataset, with ideally at least one good model produced before the mid-project demonstration.
- **Data visualisation**—graphical representation of the models and/or initial data. Acts as a visual aid in the final report. Can be started once a data model has been made, ideally with one being produced for the mid-project demonstration.
- **Final report**—the document compiling all work done with additional discussion. This will be the last work to be completed.

References

[1] J. Kawale, A. Pal and J. Srivastava, "Churn Prediction in MMORPGs: A Social Influence Based Approach," 2009 International Conference on Computational Science and Engineering, Vancouver, BC, 2009, pp. 423-428.

[2] C. Shen, P. Monge, and D. Williams, "Virtual Brokerage and Closure: Network Structure and Social Capital in a Massively Multiplayer Online Game" Communication Research, vol. 41, no. 4, 2014, pp. 459–480, doi:10.1177/0093650212455197.

[3] E. Lee, J. Woo, H. S. Kim, and H. K. Kim, "No Silk Road for Online Gamers!: Using Social Network Analysis to Unveil Black Markets in Online Games," Proc. 2018 World Wide Web Conf., 2018, pp. 1825-1834.

[4] CCP Games, *EVE Swagger Interface*, [Online], Available: https://esi.evetech.net. [Accessed Feb. 13 2020]

[5] GitHub, Inc, *GitHub*. [Online], Available: https://github.com. [Accessed Feb. 13 2020].