Universidad Internacional de la Rioja (UNIR)

ESIT

Master in Artificial Intelligence

Breakfastclub - Agent based model of a virtual classroom

Master Thesis

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City:Valencia

Date: August 1, 2019

Additional Content

Figures

Tables

Abstract

Nota: Abstract here, max 150 words.

Keywords: Agent-based model, Big Five, classroom [**?**] blass

Chapter 1

Introduction

This document is describing the Master Thesis developed by Manuel Pasieka as part of the Master in Artificial Intelligence at UNIVERSIDAD INTERNACIONAL DE LA RIOJA, S.A. 2018-2019.

As part of the Thesis the student developed an Agent-based simulation named **Breakfastclub** of a virtual classroom in order to study the effect of different Personality Traits on happiness and attention in the simulated class. This document is describing the development of the project and the results achieved.

The document is split into the following chapters.

- This first chapter introduces the reader into the motivation behind this work and its novelties.
- The second chapter will discuss the state of the art of the methods and technologies applied.
- The third chapter lays out the initials objectives as well as their adaption and final objectives of the Thesis.
- The fourth chapter describes in detail the implementation and technical solution to the proposed problem.
- The fifth chapter is focused on the Data Analysis of the results generated.
- The sixth chapter is providing a conclusion and summary of what has been presented.

1.1 Origin and Motivation

Human beings are social animals, and although this has been acknowledged by in psychology and the social studies for a long time [NOTE: References?], it is our claim that we lack the adequate tools and techniques to study in detail the behavior of humans in many different groups settings.
This work is focused on the group dynamics of children in a classroom, similar to a autonomous study group.

We have two goals for this work

1. Develop a flexible and extendable simulator for a virtual classroom
2. Study how different personality traits effect attention and happiness of individuals and the group as a whole

1.2 Justification

This work is based on previous works by [**?**] other citation [**?**], [**?**]

Chapter 2

State of the art

2.1 Agent based models

What are Agent based models and why they are interesting for studying social interactions in groups

2.2 Big Five Personality Trait model

2.3 Agent Logic???

Where to talk about agent logic and possible ways to define an agent in a multi-agent system?

2.4 Simulation Environments

Mention Unity3d, but as well NetLogo and other environments.

Chapter 3

Requirements and Objectives

3.1 Initial Objectives and Adaptions

Talk about the initial goal and scope of the project, as well as how those have been altered during development.

3.2 Final Objectives

Talk about the finally chosen and implemented objectives.

Chapter 4

Development of the simulation

This chapter is dedicated to the architecture and implementation of the simulation. Describing Agents, Environment and Simulation Mechanics, as well as Agent Logic.

Chapter 5

Data Analysis

This chapter will describe which results are generated during the simulation, how they are analyzed, and the three steps analysis is performed.

Chapter 6

Conclusion and outlook

The final chapter will include the results of the class profile comparison, come conclusions and hypothesis concerning the results.
An outlook on how the simulation could be extended to be a interactive teacher training program.

Appendix A

Appendix

Contact

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scount

Skills

- tware Development
- chine Learning
- a Analysis
- blem Solving

nguages

- German
- Python
- English

I am eager to work with other machine learning experts to solve problems of automatic decision making and general artificial intelligence (e.g. learning, search and pattern recognition).

Experience & Education

Scientific Software Engineer

present - 2012

Biocomp / Vienna Biocenter Core Facilities

Developing serval data analysis applications used by neuroscience researchers to study the amygdala circuit in the mouse brain.

In particular application to automatically quantify and analyze animal behavior, and software to process and analyze neuronal activity.

- Programming in Python, Matlab, R
- Data Visualization: matplotlib, seaborn
- Data Processing: numpy, pandas
- Data Analysis: scipy, scikit-learn

Master in Artificial Intelligence

present - 2018

Universidad Internacional de La Rioja

Master Thesis: "The effect of personality traits on attention and happiness in a virtual classroom"

- Cognitive Neuroscience
- Automatic reasoning and planing
- Natural Language Processing
- Deep Learning

Research Assistent

2012 - 2011

Universidad Politécnica de Valencia

Developing a simulation environment controlled by a stationary replica of a autonomous vehicle.

- Programming in Python, C
- Developing simulation software

Master in Parallel and Distributed Computing

2012 - 2010

Universidad Politécnica de Valencia

Master Thesis: "Peer selection and Bandwidth allocation methods in BitTorrent Systems"

- Distributed Systems
- P2P Networks
- Parallel Computing
- High performance computing

Embedded System Engineer

2010 - 2007

Adaptivia GmbH

Programming of 16 bit low power SoC devices for wireless underground sensor networks.

- Embedded system engineering
- Programming in C
- System and Network design

Bachelor of Technical Informatics

2009 - 2005

Technical University Vienna

Bachelor Thesis: "Course Timetabling using Constraints satisfaction programming"

- Software Development
- Embedded system engineering
- Computer Theory

Various Internships

2007 - 2000

Database Developer
System Administrator
Infrastructure Maintances
Warehouse clerk
Project Assistant

Publications

Pliota, P., Böhm, V., Grössl, F., Griessner,J., Valenti, O., Kraitsy, K., Kaczanowska, J., **Pasieka, M.**, Lendl, T., Deussing, J. M. and Haubensak, W. (2018) 'Stress peptides sensitize fear circuitry to promote passive coping', *MolecularPsychiatry*.

Dr. Johannes Griessner , **Manuel Pasieka** , Mr. Vincent Boehm , Mr. Florian Grössl , Mrs. Joanna Kaczanowska , Dr. Pinelopi Pliota , Mr. Dominic Kargl, Ms. Barbara Werner , Dr. Nadia Kaouane , Ms. Sandra Strobelt , Dr. Silke Kreitz , Prof. Andreas Hess and Haubensak, W. (2018) 'Central amygdala circuit dynamics underlying the benzodiazepine anxiolytic effect', *MolecularPsychiatry*.