Department of
Electrical Engineering
香港城市大學
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Economic modelling using DSGE and TextWorld

Slogan or tagline for your project

Team Members (Project ID)

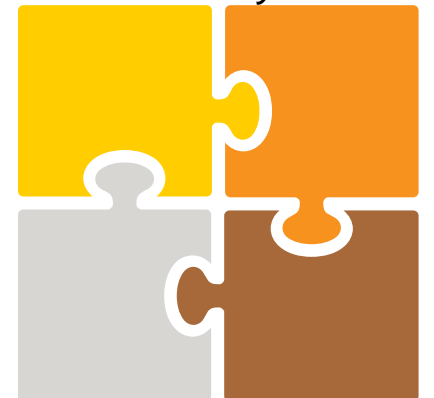10 CHOE Jungrhin | 13 Emma Mui | 29 Manun CHAUHAAN

Introduction

About your ==*project idea*==

Implementation of behavioural and social economics through linguistic multimodal diffusion ai model.
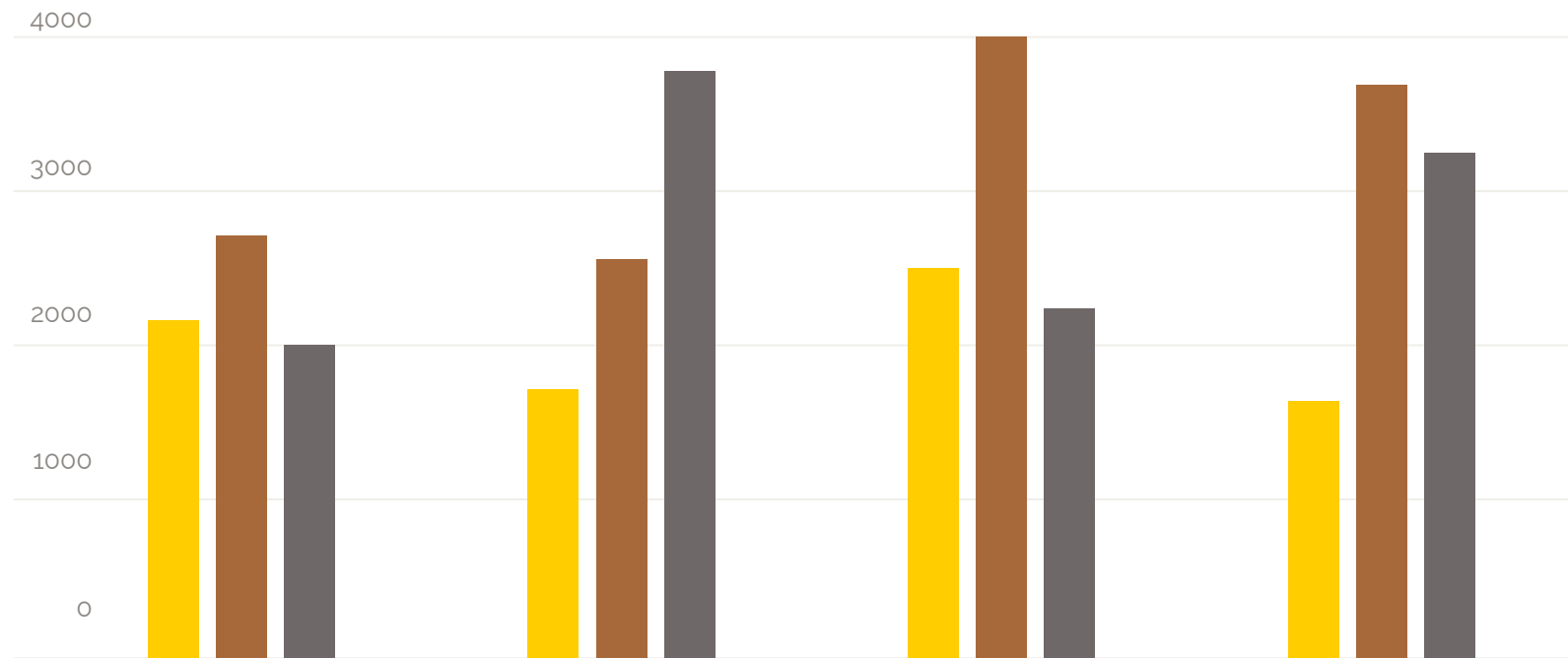
Background & Motivation

- Background:
  - DSGE is a macroeconomic analytical tool which explains historical data
  - TextWorld is a text-based game developed by Microsoft
- Motivation:
  - Modelling the human world through Economics needs to consider the basis for all social connections, which is language
- Problems we would like to solve:
  - Many economic predictions these days do not factor in human behavior, and rely solely on historical quantitative data
- Vision, Goals & Objectives:
  - We would like to
- Other Important Facts

📌 What is the **target market**?

You may use charts or graphs to illustrate the result from market research

📌 What is the ==target market==?

- ◉ Governments, corporations and banks
  - ○ Enterprise level rather than consumers

What is the ==**target market**==?

You may add a table to compare data

	A	B	C
Yellow	10	20	7
Blue	30	15	10
Orange	5	24	16

📌 Are there existing solutions?

- AI Economist model: a 2–level deep Reinforcement Learning framework
  - Uses a simulation called Gather–Trade Build
  - Has multiple economic agents trading between each other, a planner (government) and taxation
- Reinforcement learning learns the behavior of each agent
  - Easier problems use curriculum learning
  - Randomness added with entropy regularlisation
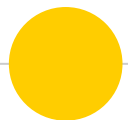
What is <mark>your solution</mark>?

- Current solution does not account for human behaviour

- Agents are assumed to be rational which was strongly disproven in the 2008 economics Nobel prize

- Novel technology we created accounts for modern human behaviour.

- Uses Twitter and TextWorld to make agents convey information in human language`

Technology

Multimodality in the form of conjunction of economics and natural language

Uses inputs of Tweets in times of economic events to gain insight into human behaviour, implement to textworld to mimic imperfect information.

Diffusion model works with learning to find original training data from noisy version, Multimodality is given auxiliary information of labeling economic state at time of tweet. Downstream tasks: tweet economic data matching, tweet recovering with retention of targeted noise (economic data insertion).

Tasks

Model Training

Data

Guess time period

Sentiment analysis

Recover destroyed training data

Destroy with respect to input economic data

Multimodal BiLSTM for ragent

Multimodal diffusion model similar to dalle-2

Tweets

Economic data

From selected sources, timestamped, may also mention government intervention behind it

Time synced

From stock market data

Room building from textworld Room content is custom

Weights

Weights

Start

Textworld world generation

Policy under question

Economy built

Custom api on top of textworld modifies room content

Model for interpretation of data from text

Economic agent

Navigational agent

Weighted move

This loop emulates effect of language and imperfect knowledge in a visual and literal manner twitter also provides social structure as an input to some extent

Future work

- Future plan to further develop the product

- Plan to deploy and market the product

Thanks!

Any **questions**?

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- Project repository on GitHub:
  https://github.com/sjdnsjd919/TextBasedDSGE