

Research Role Profile

Job Title:	Research Assistant with Large Language Models for Computer Game Dialogue
-------------------	--

Responsible to:	Head of research group, or principal investigator
------------------------	---

Responsible for:	There is no direct supervisory responsibility
-------------------------	---

Job Summary and Purpose:
To support research activity in accordance with specified research project(s) under the supervision of the principal investigator

Main Responsibilities/Activities
<p>To support a research team by contributing to the planning of research projects and undertaking prescribed research tasks in accordance with specified research project(s), making use of standard research techniques and methods. These may include fieldwork, interviews, laboratory experimentation, computer-based data analysis or library research as directed by the research award holder and will entail co-ordinating own work with that of others to avoid conflict or duplication of effort. Analysing and interpreting results of own research, under the guidance of research award holder or supervisor. Write up results and contribute to the preparation of papers for submission to appropriate journals and conferences, and other outputs as required and/or appropriate. Attend appropriate conferences for the purpose of disseminating research results of personal development. Continually update knowledge and develop skills</p> <p>To conduct routine administrative tasks associated with a specified research project, for example risk assessment of research tasks, organisation of project meetings and documentation. This will entail planning own day-to-day research activity within the framework of the agreed programme, dealing with problems that may affect the achievement of research objectives and deadlines and implementing procedures required to ensure accurate and timely formal reporting and financial control</p> <p>Demonstrating, or occasionally assisting with undergraduate supervision within the post holder's area of expertise and under the direct guidance of a member of the Faculty academic staff.</p>

Research Role Profile

Person Specification

The post holder must have:

A first degree or a professional qualification or equivalent in a relevant subject.

At least part-completed a relevant doctoral degree or have relevant experience in a given field.

Whilst there is no requirement for previous work experience, the post holder will be expected to be able to support research activities by performing experiments and/or undertaking studies and analysing/ interpreting results.

Relationships and Contacts

Direct responsibility to the principal investigator or academic supervisor.

Special Requirements

To be available to participate in fieldwork as required by the specified research project.

All staff are expected to:

- Positively support equality of opportunity and equity of treatment to colleagues and students in accordance with the University of Surrey Equal Opportunities policy.
- Help maintain a safe working environment by:
 - Attending training in Health and Safety requirements as necessary, both on appointment and as changes in duties and techniques demand
 - Following local codes of safe working practices and the University of Surrey Health and Safety Policy
- Undertake such other duties within the scope of the post as may be requested by your Manager.

Research Role Profile

Addendum

This document provides additional information relating to both specific aspects of the post/faculty and any post specific person specification criteria. The information contained within this document should always be read in conjunction with the accompanying generic Job Purpose.

Job Title:

Research Assistant in Large Language Models for Character Dialogue

Background Information/Relationships

As part of the GAIN (Games and Innovation Nexus) proof of concept projects in the University of Surrey, this project is focussed on approaches to exploit modern large language models to manage the dialogue with non-player characters in a computer game. We offer an exciting research assistant position at the Faculty of Engineering and Physical Sciences, University of Surrey, to work with project lead Dr. Frank Guerin within the School Of Computer Science, and co-investigators Amir Esfahani, and Stephen Mooney (Literature and Languages). This role will focus on experimental work to build a proof of concept demonstration that showcases varied and open-ended dialogues within a computer game scenario.

We are seeking candidates with expertise in an area pertinent to the project and experience in computer programming, large language models, and use of GPU machines managed with submission software. The successful candidate is expected to be able to organise his/her work with minimal supervision and prioritise work to meet deadlines of the project. Due to the scientific and experimental nature of the project, experience with writing up results as scientific reports is expected.

Current mainstream computer games do not exploit the abilities of large language models (LLMs) for dialogues. Instead they offer pre-scripted and limited options for what players and NPCs (non-player characters) can say. LLMs can potentially offer an open-ended and more natural dialogue. The added requirement is to integrate with the constraints of the game world: we cannot allow an LLM to freely say anything about any topic; it must be constrained to a certain set of knowledge that the particular NPC knows, and to play the role of that character. This will allow players to converse with NPCs leading to more open-ended experiences and influencing the story line of the game in novel ways.

The main challenge in the project is to create a middle layer between a game engine and an LLM for dialogue. The game engine has a representation of knowledge of the world, such as the items each character has in possession, their value, location, and the current local situation, as well as recent events in the game world. In addition, each NPC has a certain character personality, and its own character knowledge. The middle layer needs to use the relevant parts of this knowledge to interface with the LLM to drive the dialogue generation, and will need to be managed by techniques including prompt engineering, retrieval augmented generation, knowledge graphs, post editing, and selecting from and merging the outputs of a number of LLM queries to produce the final response. Evaluation with play testers will also be required, and feedback for improvements taken on board at various points.

Research Role Profile

A Research Fellow is required to work alongside Surrey's Project Lead (Frank Guerin) and Co-investigators. The researcher will also have opportunity to participate with other natural language processing researchers in the University, and engage with seminars.

Person Specification

This section describes the sum total of knowledge, experience & competence required by the post holder that is necessary for standard acceptable performance in carrying out this role. This is in addition to the criteria contained within the accompanying generic Job Purpose.

Qualifications and Professional Memberships	Essential/ Desirable
A degree in computer science or engineering.	Essential
Technical Competencies (Experience and Knowledge) This section contains the level of competency required to conduct the role (please refer to the competency framework for clarification where needed and the Job Families Booklet).	Essential/ Desirable
Experience of computer programming	Essential
Experience and proficiency in downloading and running an LLM locally on a GPU	Essential
Proficiency in working in Linux	Essential
Some research experience, and authoring of research papers	Desirable
Knowledge of machine learning, deep learning, transformer architectures, Large Language Models (LLMs)	Desirable
Knowledge of prompt engineering approaches, retrieval augmented generation, knowledge graphs used with LLMs to constrain and guide responses.	Desirable
A masters degree	Desirable

Key Responsibilities

This document is not designed to be a list of all tasks undertaken but an outline record of any faculty/post specific responsibilities. This should be read in conjunction with those contained within the accompanying generic Job Purpose.

1. Run experiments on dialogue generation using techniques such as prompt engineering, retrieval augmented generation, knowledge graphs, post editing, and selecting from and merging the outputs of a number of Large Language Model (LLM) queries to produce the final response.
2. Interface the LLM with game world knowledge and character knowledge to constrain responses.
3. Evaluate dialogues produced using criteria of knowledge expressed and character style.

Research Role Profile

4. Program basic interface to allow play testers to interact with the LLM-dialogue system.
5. Contribute intellectually and analytically to the research project.

N.B. The above list is not exhaustive.