infobip

Senior AI Research Scientist

Dear Candidate,

Welcome to the next stage of Infobip's selection process!

In this segment, you will be asked to complete a few tasks where you will be able to showcase your approach to our daily tasks and brain teasers.

We wish you the best of luck! 😊

Scenario:

Imagine you have e-commerce clients in South East Asia (possibly dealing with different regional languages) who use our telecommunication APIs to send mass-scale newsletters via e-mail. Each newsletter campaign possibly reaches hundreds of thousands (if not more) end-users which may or may not interact with the products advertised in those campaigns. Some clients send newsletters with links to the products where you can track clicks, but other clients don't and only some descriptive text or images of what is being advertised. Now, some of those clients want you to help them boost their revenue using the data that they have already provided you with.

Task:

How could we leverage historical newsletter data to build a sophisticated conversational recommender system (e.g., as a WhatsApp chatbot) for product upselling and cross-selling of a particular client?

Assume that you already have a system available to deploy a conversational agent (e.g., a WhatsApp chatbot) where you only need to provide one or more APIs that take a textual input in and can return any kind of output (e.g., text, image, etc.).

How would you propose tackling such a problem?

Here are some points which would be beneficial to take into account while proposing a solution:

1. **Data Extraction:**

    o How can structured product metadata (e.g., product names, categories, prices, availability) and embedded URLs be extracted from historical e-mail newsletter messages?

    o What additional insights, such as user interests, trending topics, or purchasing behaviors, can be identified and extracted?

2. **Research Foundation:**

   o What are at least 3 state-of-the-art (SOTA) papers relevant to product metadata extraction, topic modeling, multilingual NLP (e.g., Chinese or some other SE Asian languages), and conversational recommender systems?

3. **Architecture Proposal:**

   o What specific components (e.g., Data pipelines, NLP extraction methods, embedding models, generative AI models, recommendation algorithms) are necessary?

   o Which NLP tools or models are suitable for multilingual processing, particularly for Chinese?

   o How will the data extraction system integrate with a generative conversational recommender system (recommendation logic, personalization capabilities, conversational flow)?

4. **Evaluation and Metrics:**

   o What robust success metrics can be used to evaluate the system in production (e.g., engagement rates, conversion rates, accuracy of metadata extraction, recommendation relevance, user satisfaction)?

5. **Justification of Approach:**

   o Why is your selected approach suitable? Reference the literature review and explain how the chosen state-of-the-art methods and research papers support your architectural and methodological decisions.

Expected result:

You don't need to implement everything (or even anything). We are interested in the way how you would approach this problem. Focus on **depth of thought, creativity, and clarity**.

You can submit either a short **Technical Report** (architecture diagrams, research on state-of-the-art solutions, implementation plan, etc.), **Prototype Code** (Jupyter Notebooks or scripts demonstrating one or more core components), a **Short Slide Deck** (a summary of your proposal from a technical and research perspective) or a combination of those.

Bonus Points: Use of recent research papers published at conferences like ACL, RecSys, EMNLP, KDD or NeurIPS that you think may be adapted/reproduced or even improved.