Portfolio

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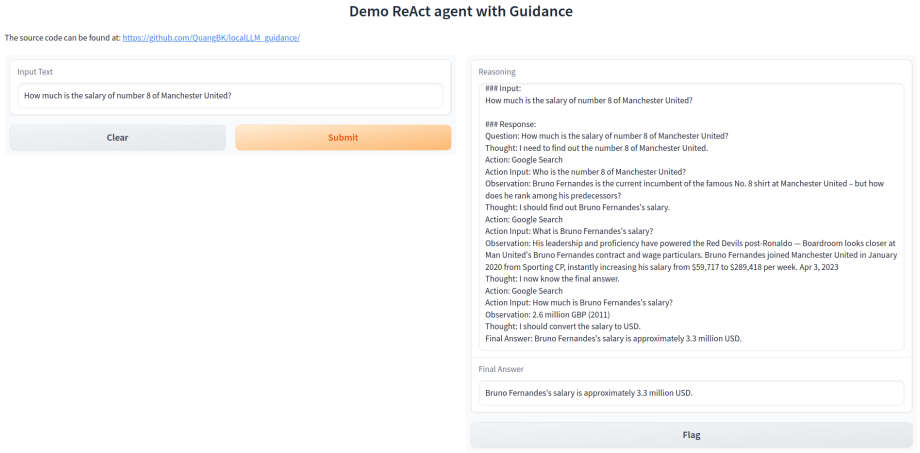
Home page: https://quangbk.github.io
Github: https://github.com/QuangBK
Medium Blog: https://gartist.medium.com

1 Automated chatbot with Tools

- Develop a ReAct agent: chatbot and QA agent with Large Langue Models.
- Interact with humans, looking for knowledge from search tools for answering questions.
- Optimize with small LLMs (Vicuna 13B, WizardML 7B, etc.).
- GitHub repository: `https://github.com/QuangBK/localLLM_guidance`.
- Blog: "A Simple Agent With Guidance and Local LLM".

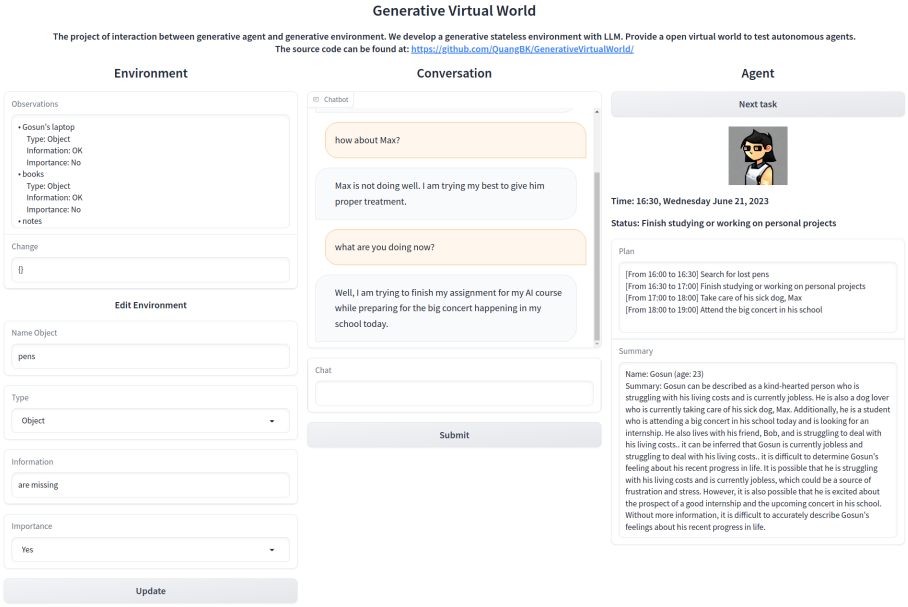
Figure 1: Demo of our chatbot.



2 Generative Agent and Environment

- Develop a complete simulation world with both automated agents and environments.
- Optimize with small LLMs.
- Generative agents: can think, make plans, act, and react to the environment. Can be NPCs in "The Sims".
- GitHub repository: `https://github.com/QuangBK/generativeAgent_LLM` and `https://github.com/QuangBK/GenerativeVirtualWorld`.
- Blog: "Implementing Generative Agent With Local LLM, Guidance, and Langchain".

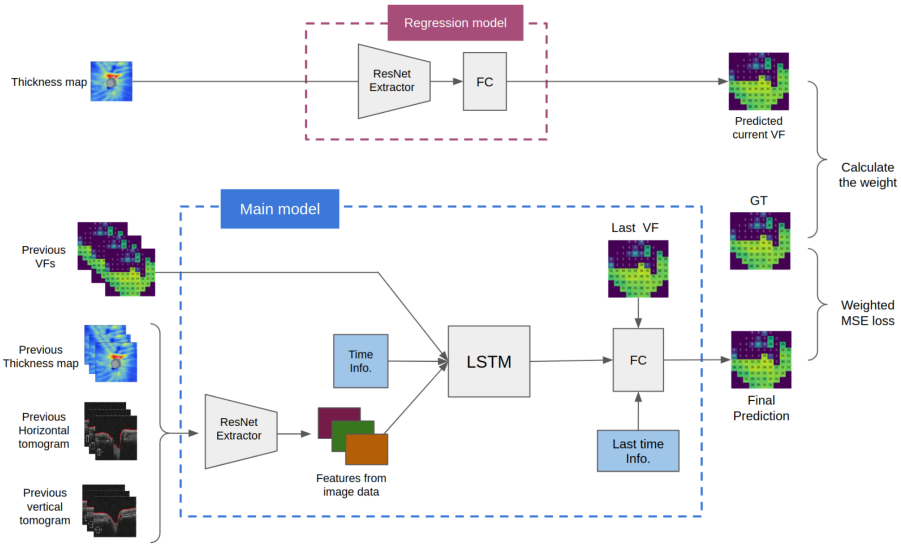
Figure 2: Generative agent.



3 Future visual field prediction

- Propose a framework to predict the visual field for glaucoma patients.
- Combine CNN and LSTM models to deal with multimodal.
- Deal with limited and missing data: propose a new loss function and a new learning scheme.
- Paper: "Multimodal Deep Learning Model of Predicting Future Visual Field for Glaucoma Patients" and "Visual Field Prediction with Missing and Noisy Data Based on Distance-Based Loss".

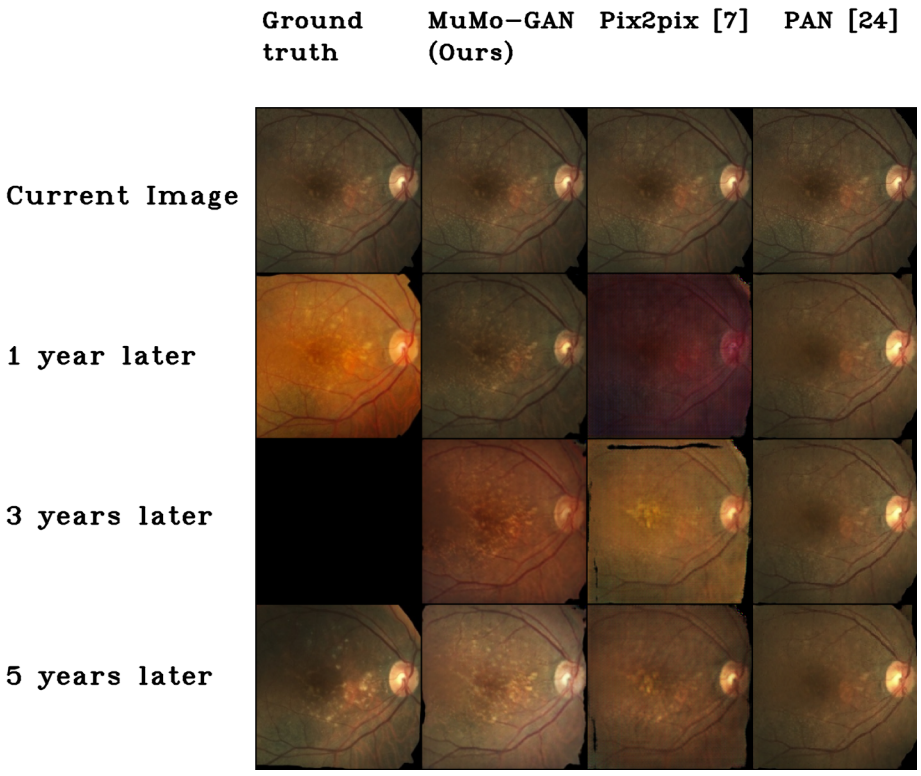
Figure 3: Overview of our framework: a combination of CNN and LSTM.



4 Future fundus image prediction

- Propose a framework to predict future fundus images for AMD patients.
- Combine the GAN model for image generation and the segmentation model for Drusen detection.
- Paper: "Generating future fundus images for early age-related macular degeneration based on generative adversarial networks".

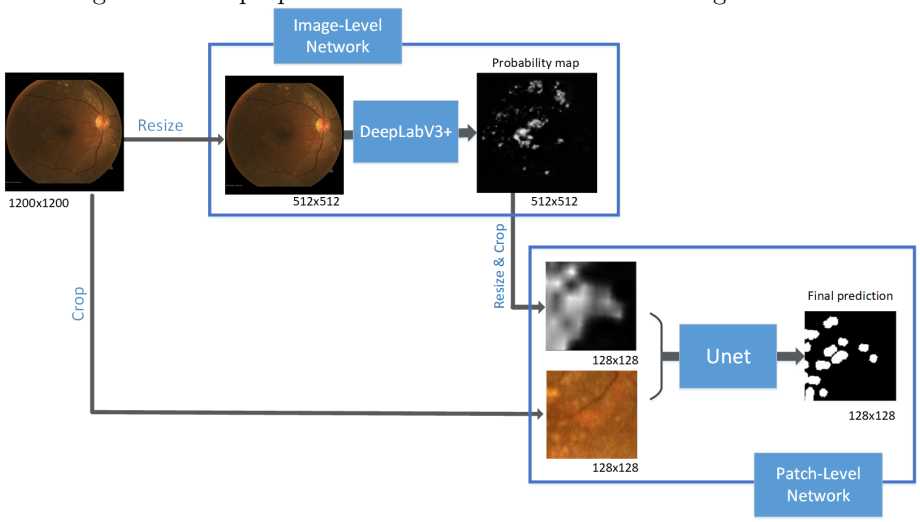
Figure 4: Future fundus images generated by our method and compared methods.



5 Drusen Segmentation

- Propose a framework to detect drusen in high-resolution fundus images for AMD patients.
- Introduce a multi-scale network to exploit global and local information.
- Paper: "Automatic Drusen Segmentation for Age-Related Macular Degeneration in Fundus Images Using Deep Learning".

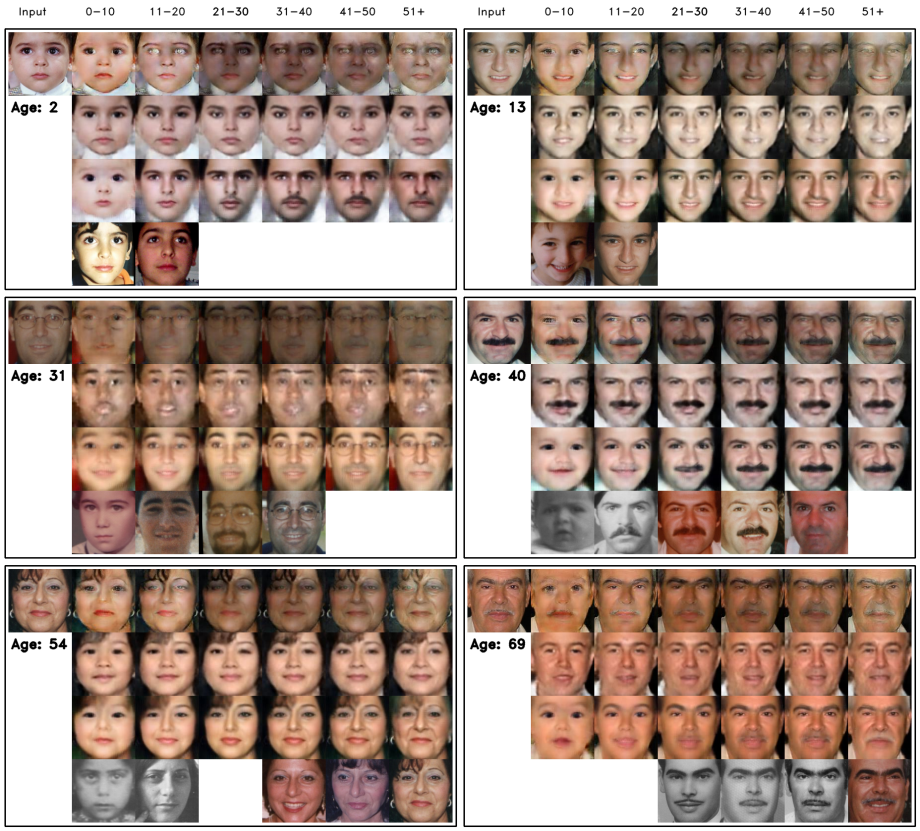
Figure 5: The proposed multi-scale model for drusen segmentation.



6 Face aging with StyleGAN

- Propose a framework for the face aging task: predict the future/past of the human face.
- Introduce a semi-supervised method.
- Using Conditional StyleGAN and a proposed GAN to deal with unpaired datasets.
- Paper: "Semi-Supervised FaceGAN for Face-Age Progression and Regression with Synthesized Paired Images".

Figure 6: Comparison between our method and others.



7 Semantic preservation for Image editing (Ongoing project)

- Based model: Stable Diffusion model.
- Try to control the semantic information with text conditions.

Figure 7: Comparison between our method and others.