Digital Assistant Cooperation Proposal

We have spent the last few weeks working on the open source Stanford digital assistant ‘Genie’ to enable interaction between Genies specifically via messaging services to establish social interaction and cooperation within AI assistance. We aim to develop social systems within our Genies messaging features so that it may contact certain groups based on preference and familiarity as well as more pragmatic approaches of allowing cooperation with your peers – i.e. “Genie can you ask who has yesterday’s lecture notes”.

We split the project into two main parts early on; a “back end” consisting of an API (Application Programming Interface, which does core tasks such as storing contacts, accessing messaging platforms, etc) that manages contacts across multiple communication services (Matrix initially, with the API designed so that more can be added on easily), and a “front end” implementation of this API for Genie, allowing Genie users to communicate with each other.

We have hit multiple road blocks, both technically and legally with the Genie implementation, and through the development of our project architecture we have realised with some small tweaks the project can achieve the same goal, but with a significantly broader reach and more avenues for growth.

Issues with Genie:

- **USA Based –** Genie is a Stanford Research Project, we can ***not*** create our own Genie Home Server instance without breaking the terms of their consent form* which explicitly states “You must be 18 or older to participate, and currently residing in the United States”.
- **Activity –** Genie was primarily chosen as it’s an open source virtual assistant, with the ability to be self hosted so as to not give away users data to monolithic corporations such as Amazon, Google, or Apple. The issue is there are many of these projects available, and Genie is seemingly lagging behind the others in terms of development activity & user base - there have been 3 posts on the community forum in the past 2 months. This is a 2 part issue:
  - Lack of user base: in the end, we’re creating something in the hopes of helping solve a problem for end users and improve communication options between groups. If we were to implement a Genie specific solution, there’d be a tiny community who can take advantage of it, if any users at all.
  - Lack of documentation/support: The project is large and complicated, with many revisions & different versions over the years. With Genie’s limited developer activity, it’s very difficult to find concrete examples of how things should be implemented in the latest version, and getting support will be significantly harder compared to larger, more active alternatives.

Our proposed “re-shift” of focus

Instead of focusing specifically on Genie and implementing contact management/communication for that project, we could focus on building out our back end communication system. The system would offer a simple workflow for other virtual assistants and projects to integrate and use it. It would effectively be a “middle-man” for communication, instead of assistants implementing messaging with one platform, say Whatsapp, they’d use our system with multiple platforms baked in, with the ability for new platforms to be added on by the greater community.

This avoids us creating the same issue we’re trying to solve – communication being tied to specific services. Similar to how people don’t want to try communication alternatives to Whatsapp, such as

Signal, because all of their contacts are only on the original service, we could accidentally create a big barrier to entry to our communication solution: needing to be on the Genie ecosystem.

By focusing on the back end system, we can create something which can be implemented and used on every Virtual Assistant project, including Genie, other open source alternatives, but also the current “big 3” of Amazon Alexa, Google Home, and Apple’s Siri. This not only shifts the project in a more realistic direction where we can achieve something useful, but solves the problem of being tied into specific devices. You would be able to communicate over, Signal, Whatsapp, IRC, in a unified manner, on any device – your grandmothers Amazon Alexa could receive messages from your Home Assistant alternative.

Where would we go from here?

At a technical level, we would continue our work on the back end, an API that handles communication with different platforms (Matrix, Signal, Telegram, Whatsapp, etc), along with a database to manage user contacts & groups.

This allows us to develop different parts of our system in parallel, meaning we will get more done with our time with this project and it can live after us by being easily maintainable & expandable. The project architecture would allow us to work on extra messaging platform integrations (starting with Matrix, then moving onto others such as Whatsapp), extra implementations of our messaging system (Genie, Alexa Skills, Google Home, other open source alternatives), and improvements to our contact management.

The short term goal would be to have a working API that can communicate with at least one messaging platform, and handle basic contacts and groups. From there, we can build more messaging platform integrations & more advanced features for Virtual Assistant implementations.

Throughout, we would be creating detailed documentation and designing everything with future expansion in mind so that other developers can build upon it.

Conclusion

We would re-shift our focus from creating a solution tied heavily to the Genie system to a more general solution to communication across platforms while managing groups/users across them.

* Genie Home Server Instance Consent Form:

You are invited to participate in a research study on virtual assistants. With your consent, the Genie virtual assistant will record the commands you give it. Recording the commands will allow Genie virtual assistant to improve its understanding of natural language. The collection is completely confidential, and personal data (such as emails and phone numbers) will be stripped automatically. You must be 18 or older to participate, and currently residing in the United States.
Risks and Benefits

We do not foresee any risk from this study. The benefits which may reasonably be expected to result from this study are that the open-source Genie virtual assistant improves over time. We cannot and do not guarantee or promise that you will receive any benefits from this study.Your decision whether or not to participate in this study will not affect the functionality of the Genie virtual

assistant service, or your ability to use it.You will not receive any payment for your participation.
Participant Rights

If you have read this form and have decided to participate in this project, please understand your participation is voluntary and you have the right to withdraw your consent or discontinue participation at any time without penalty or loss of benefits to which you are otherwise entitled. The alternative is not to participate. You have the right to refuse to answer particular questions. The results of this research study may be presented at scientific or professional meetings or published in scientific journals. Your individual privacy will be maintained in all published and written data resulting from the study.

Your private information collected as part of the research might be shared with other researchers in anonymized form in the future, without additional consent from you.
Contact Information

Questions: If you have any questions, concerns or complaints about this research, its procedures, risks and benefits, contact the Protocol Director, Giovanni Campagna, at [gcampagn [at] cs.stanford.edu].

Independent Contact: If you are not satisfied with how this study is being conducted, or if you have any concerns, complaints, or general questions about the research or your rights as a participant, please contact the Stanford Institutional Review Board (IRB) to speak to someone independent of the research team at (650)-723-2480 or toll free at 1-866-680-2906, or email at IRB2-Manager@lists.stanford.edu. You can also write to the Stanford IRB, Stanford University, 1705 El Camino Real, Palo Alto, CA 94306.

If you agree to these terms, please keep a copy of this form for your records.