



NeighbourhoodBot:

Connecting communities with conversational agents

Motivation

In Western urban environments, only 24% of residents know their neighbours [3], and 60% of American adults report feeling lonely [1]. Modern society [2] has created environments that isolate people, leading to widespread feelings of loneliness and depression.

Solution

Research in community development emphasizes the benefits of focusing on strengths rather than problems, advocating for empowering residents by recognizing their skills [4]. Chatbots can facilitate this approach and also serve as intermediaries between those seeking assistance with those able to provide it.

Objectives

RQ1: Design and implement a chatbot informed by community development research to enhance neighborhood engagement.

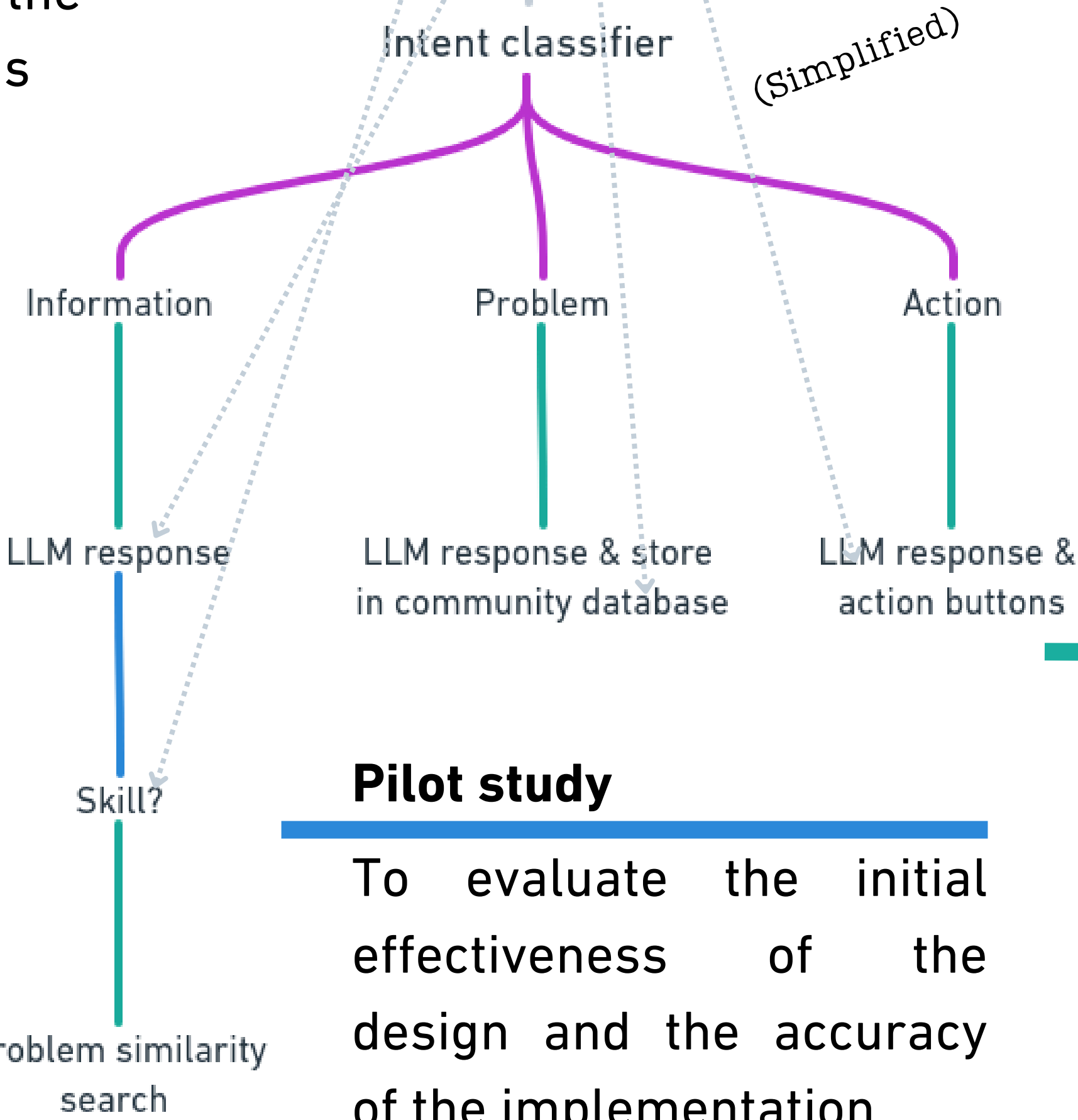
RQ2: Evaluate whether chatbots focused on community content increase users' responsibility, care and contributions to their neighbourhood.

RQ3: Assess the effectiveness of chatbots in connecting individuals seeking help with those willing to help.

Design & implementation (RQ1)

To address RQ1, a literature review was conducted in which we made the following choices:

Design	Implementation
<ul style="list-style-type: none">Prompt users to share their skills and to take action.Provide practical and immediate solutions.Be informative and appropriate.Link user problems to neighbours.	<ul style="list-style-type: none">Rule based Rasa framework.BERT multi-class classifier.LLaMA 2 7B-GPTQ model.Milvus dataset & similarity search.



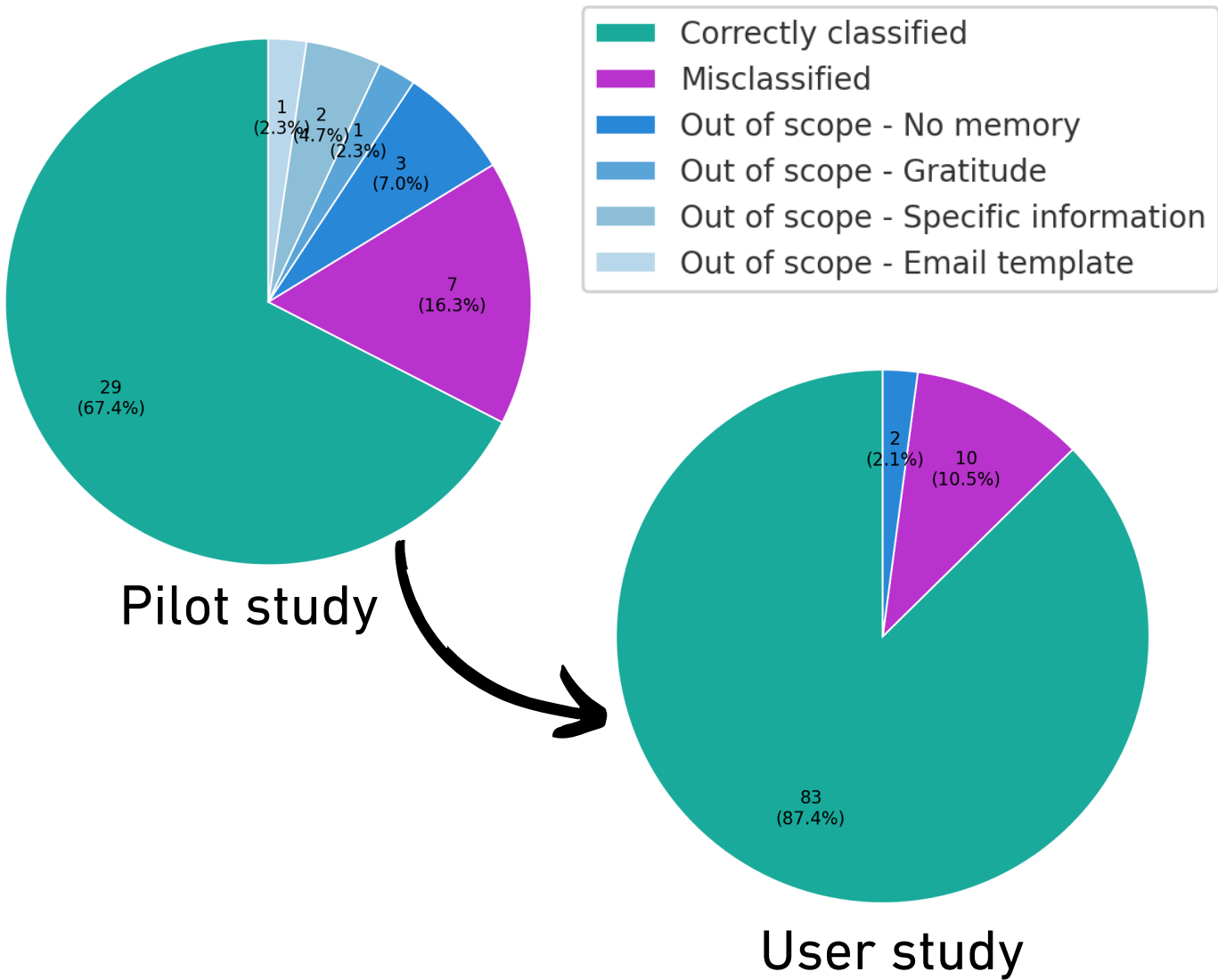
Pilot study

To evaluate the initial effectiveness of the design and the accuracy of the implementation, six participants interacted with the chatbot. Incorrectly classified and out-of-scope intents were assessed, leading to subsequent improvements in implementation.

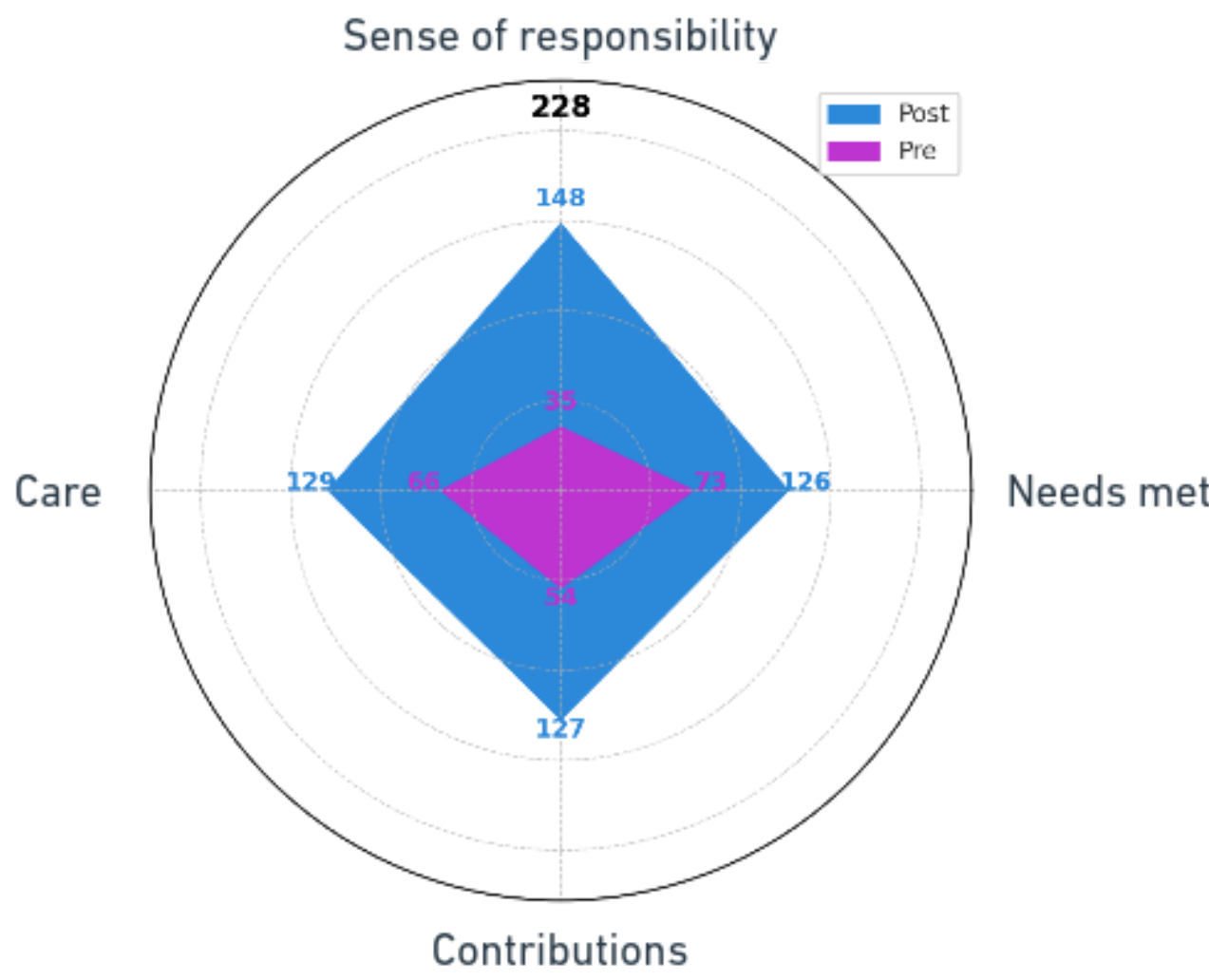
User study

A simulated neighbourhood where 19 participants interacted with NeighbourhoodBot. Evaluated metrics include the accuracy of matching help requests, changes in participants' sense of community through questionnaires and number of actions selected.

Intent accuracy (RQ1)



Community questionnaire (RQ2)



Skill-problem matches (RQ3)

My skills and interests are Creating social media content and cryptocurrency

I found the following problem from a member of your neighbourhood that may be related: 'We need educational sessions on cryptocurrency and digital investments.'. Is this something you're interested in working on a solution?

9 ideal matches, 3 false positives

Overall

Contributes to research into chatbots, community development and AI in local governance. It demonstrates how chatbots can advance community development without intermediaries. It offers a novel and accurate implementation that enhances citizen engagement and effectively connects individuals with appropriate helpers.

[1] Rachael Behr. Noreena Hertz, The Lonely Century: How to Restore Human Connection in a World That's Pulling Apart. The Review of Austrian Economics, 36(3):497–500, September 2023.
[2] Johann Hari. Lost Connections: Uncovering the Real Causes of Depression – and the Unexpected Solutions. Bloomsbury Publishing, January 2018.
[3] Kim Parker, Juliana Horowitz, Anna Brown, Richard Fry, D'Vera Cohn, and Ruth Igielnik. What unites and divides urban, suburban and rural communities. Report, Pew Research Center, May 2018.
[4] Cormac Russell and John McKnight. The Connected Community: Discovering the Health, Wealth, and Power of Neighborhoods. Berrett-Koehler Publishers, September 2022.