Designing for In-Home Long-Term Family-Robot Interactions:
Family Preferences, Connection-Making, and Privacy

Bengisu Cagiltay, University of Wisconsin-Madison,
bengisu@cs.wisc.edu | bengisucagiltay.github.io

Motivated by the need for more family-centered approaches in child-robot interactions, the goal of this research is to design in-home social robots that can facilitate interactions between children and family members.

Exploring Family Preferences for Designing Social Robots for Children

6 Families | Children age 10-12 | Participatory Design Study

Through participatory design sessions we explored children's and families' design preferences for an in-home social robot and found three key themes [1]. Families expected:

1. Robots to play two main **roles**: an *assistant* and/or *companion*.

2. The robot to be included in **group interactions** and shared recreation activities.

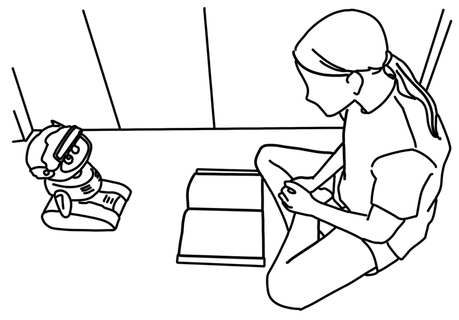
3. **Conversational privacy concerns** regarding how a robot would manage sensitive information shared in private or group conversations.

One-Month In-Home Deployment of a Reading Companion Robot

16 Families | Children age 10-12 | Field Deployment Study

Children's engagement with the robot categorized as:

- Modified their interaction (3),
- Discontinued their use (2),
- Interrupted more than one week (3),
- Adopted the robot (6).



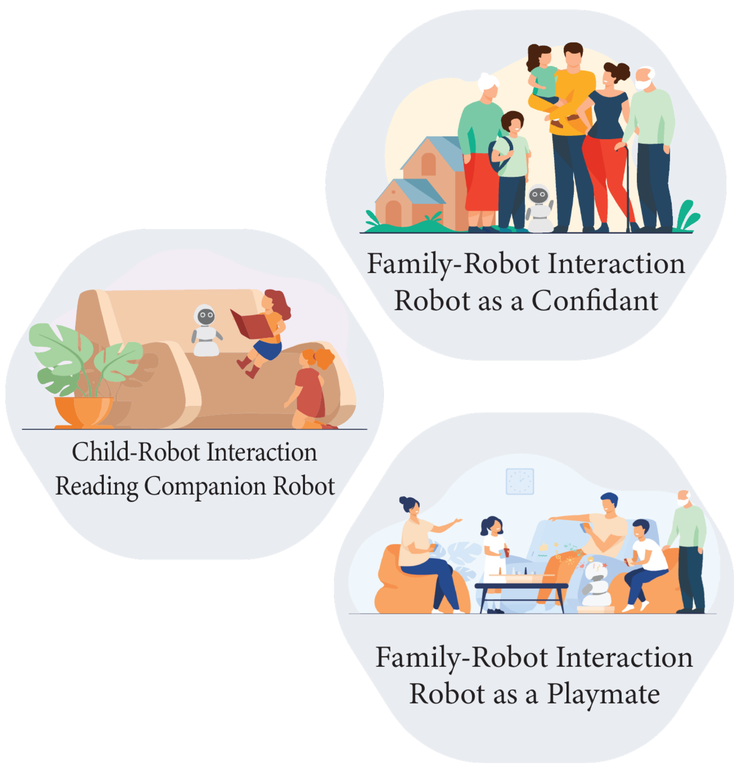
- *External factors* such as vacations, family visits, and extracurricular activities;
- *Motivational factors* such as family/parental involvement children's individual interests impacted children's engagement with the robot [2].
- *Video analysis* showed that child-robot interactions go beyond the child. Spontaneous and enriching family interactions formed around the robot [3].

Next Steps and Research Questions

Our prior work focused on understanding *family preferences* and designing child-robot interactions, primarily for the role of a reading companion robot.

For a family-centered approach, our future work will focus on designing in-home family-robot interactions to support families' *connection making* and to mitigate their communication *privacy concerns.* Future work will also incorporate theoretical knowledge from interdisciplinary fields [4, 5, 6]:

- Family Systems Theory,
- Family Ecological Model,
- Communication Privacy Management Theory.



RQ1:
How a robot, acting as a confidant, can mitigate conversational privacy concerns between family members?

RQ2:
How a robot, acting as a playmate, can facilitate family interactions and connection-making during a shared recreational activity?

References
[1] Bengisu Cagiltay et al. 2020. *Investigating family perceptions and design preferences for an in-home robot.* ACM IDC'20.
[2] Bengisu Cagiltay et al. 2022. *Understanding Factors that Shape Children's Long Term Engagement with an In-Home Learning Companion Robot.* ACM IDC'22.
[3] Joseph Michaelis, Bengisu Cagiltay et al. 2023 ``*Off Script:" Design Opportunities Emerging from Long-Term Social Robot Interactions In-the-Wild.* ACM HRI'23
[4] Murray Bowen. 1966. *The use of family theory in clinical practice.* Comprehensive psychiatry
[5] Mary P Andrews et al. 1981. *An ecological approach to study of the family.* Marriage & Family Review
[6] S. Petronio. (2017). *Communication privacy management theory: Understanding families.* Engaging theories in family communication.

This work was partially supported by NSF #1906854 and #2202803

CHI23 | WISCONSIN UNIVERSITY OF WISCONSIN-MADISON | People & Robots Laboratory

Scan this QR code to access the PDFs for the Poster and Extended Abstract