Many elderly individuals encounter difficulties with everyday tasks like accessing cabinets, drawers, or small household items. While current assistive devices often focus on larger-scale tasks or complex automation, there is a need for simpler, affordable devices that can improve accessibility for smaller, daily interactions. My project aims to fill that gap.

1. Marcus Mast, Michael Burmester, Katja Krüger, Sascha Fatikow, Georg Arbeiter, Birgit Graf, Gernot Kronreif, Lucia Pigini, David Facal, and Renxi Qiu. 2012. User-centered design of a dynamic-autonomy remote interaction concept for manipulation-capable robots to assist elderly people in the home. J. Hum.-Robot Interact. 1, 1 (July 2012), 96–118. https://doi.org/10.5898/JHRI.1.1.Mast

This study explores the design of a service robot that assists elderly individuals with daily tasks at home, either autonomously or with remote human help when needed. The researchers used a user-centered design approach, testing the robot in real-life settings to ensure it could adapt to various household tasks. The findings reveal that flexible, semi-autonomous robots are highly beneficial in supporting elderly independence within complex home environments

2. Lê Q, Nguyen HB, Barnett T. Smart Homes for Older People: Positive Aging in a Digital World. *Future Internet*. 2012; 4(2):607-617. https://doi.org/10.3390/fi4020607

This paper reviews smart home technology as a means to enhance independence and safety for older adults. Smart homes provide automated features like remote door operation and health monitoring, which are particularly useful for seniors. However, challenges such as accessibility, privacy concerns, and ease of use remain. The study suggests that, with careful design, smart home systems can significantly support elderly users' well-being and self-sufficiency

3. Angelo Vaiano Filetti, Lucas Brandão Ceroni, Pedro Henrique Camargo França, and Maria Amelia Eliseo. 2024. Assistive Mobility Technology for Visually Impaired. In Proceedings of the XXIV International Conference on Human Computer Interaction (Interacción '24). Association for Computing Machinery, New York, NY, USA, Article 14, 1–4. https://doi-org.proxy.library.emory.edu/10.1145/3657242.3658592

The authors present an auditory navigation tool for visually impaired individuals, designed to improve mobility and independence. Using smartphone technology and auditory feedback, the device guides users safely through both indoor and outdoor spaces. Testing shows that sound-based navigation helps visually impaired individuals gain a clearer sense of their surroundings, promoting safer and more autonomous movement in complex environments

4. Zhenhong Lei and Xinjun Li. 2024. Improved Grip Stability in Healthcare: Mixed Reality Assistance Devices for Degenerative and Age-Related Hand Conditions. In Companion of the 2024 on ACM International Joint Conference on Pervasive and Ubiquitous Computing (UbiComp '24). Association for Computing Machinery, New York, NY, USA, 425–429. https://doi-org.proxy.library.emory.edu/10.1145/3675094.3678496

This study introduces a grip-assist device for people with arthritis or hand mobility issues, using mixed reality (MR) to provide both physical support and visual guidance. The device combines a servo motor for grip stability with MR overlays that guide users through tasks, making it easier to perform daily activities. Feedback from early users suggests that this type of dual support can improve both the comfort and effectiveness of assistive devices for people with limited hand mobility

5. Sandra Souza Rodrigues, Renata Pontin De Mattos Fortes, and Kamila Rios da Hora Rodrigues. 2024. Towards Design Guidelines for IoT Applications considering Elderly Users. In Proceedings of the XXII Brazilian Symposium on Human Factors in Computing Systems (IHC '23). Association for Computing Machinery, New York, NY, USA, Article 64, 1–12. https://doi-org.proxy.library.emory.edu/10.1145/3638067.3638139

This paper establishes design guidelines to make IoT applications more accessible and user-friendly for elderly people. Based on interviews and testing, the guidelines focus on simplicity, intuitive design, and accessibility, making technology easier for seniors to adopt. The guidelines highlight the importance of usability in IoT, ensuring that devices can effectively support independent living for aging populations