

The Maastricht Center for Robots

*Uniting service robot research,
education and impact*

Maastricht Center for Robots:

Inzicht door verbinding tussen
onderzoek, onderwijs en praktijk

De toekomst van de zorg: reden tot zorg?

Prof. Dr. Gaby Odekerken-Schröder

28 januari 2024



Maastricht University

Video: Service robots rising or falling stars?

Service robots: rijzende of vallende sterren?



 Save for later!

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2015 eerste robot onderzoek
2019 eerste robot proefschrift verdedigd
2020 oprichting Maastricht Center for Robots

MCR



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Simon Beusaert



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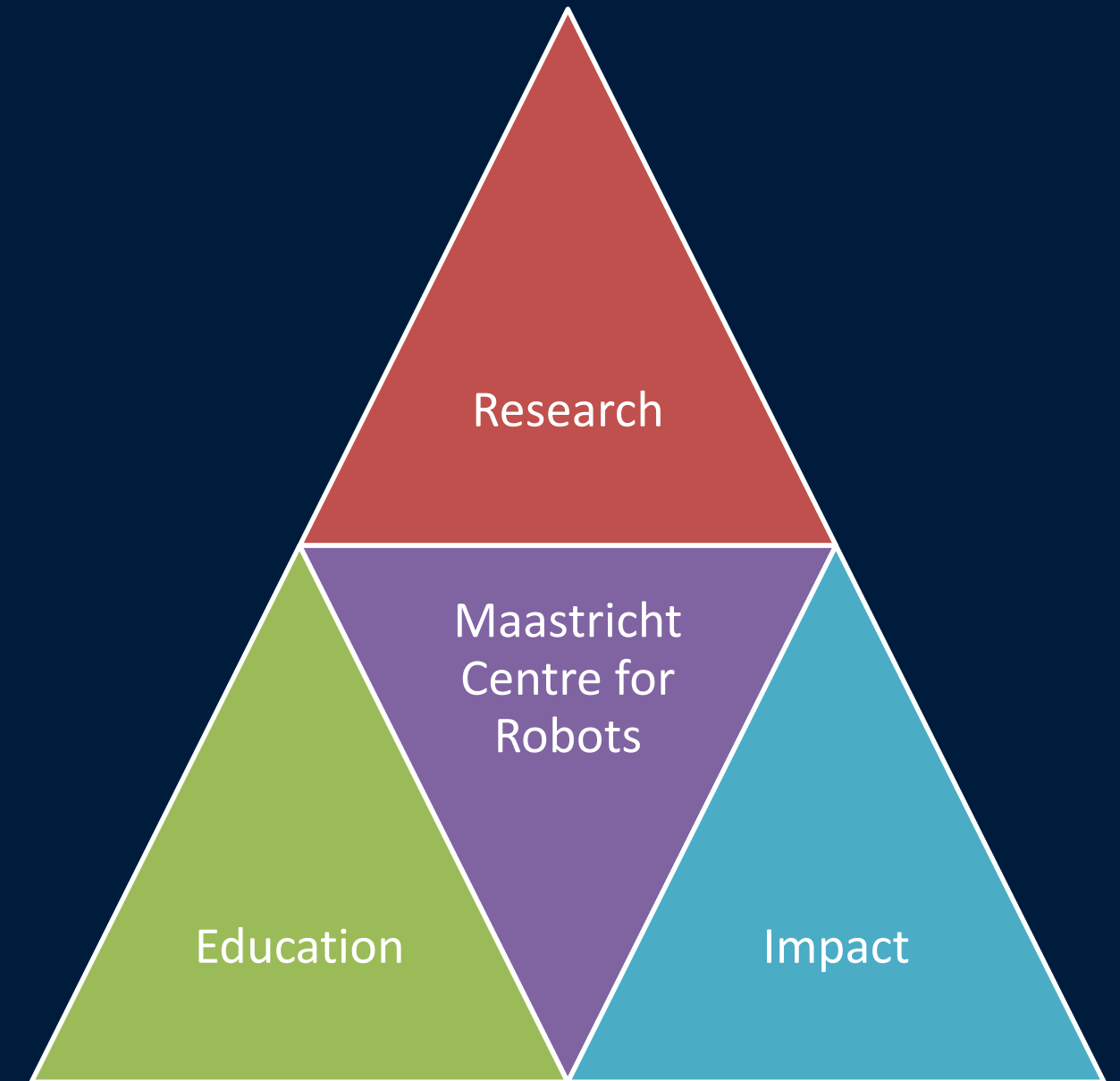
Alexandru Maris



Gaby Odekerken-Schröder

TEAMSCIENCE

*Vis
ie:*



Samenwerking met partners in de zorg





Onderzoekssamenwerking met andere gewaardeerde partijen uit de praktijk



ROBOT CTRL.

DADAWAN

DE HEER MEDICOM



MENS • ZORG • VEILIGHEID

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Twee voorbeeld projecten:

- 1. Lopend grootschalig project in de GGZ**
- 2. Pilot met pluchen baby robot bij dementie**



1. Sociale robots: regionale samenwerking Limburg / Zuid-Oost Brabant. 50 robots, 6 GGZ instellingen, CZ zorgkantoor, MCR, HSZuyd, Robot Ctrl



Insteek: per cliënt herstellen van bronnen

A person wearing a teal lab coat and a white t-shirt is holding a baby robot. The robot has a bald, peach-colored head and is wearing a green and white striped shirt. The person's hands are visible, supporting the robot. The background is a plain, light-colored wall.

2. Pilot met baby robot bij 1 zorginstelling

A close-up photograph of a woman with dark, curly hair holding a baby doll. The doll is bald and wearing a yellow and white striped shirt. The woman's hand is visible, holding the doll's head. The background is a plain, light-colored wall.

**Insteek: per cliënt ervaren van waarde
(geen, zingeving, contact)**

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**Kernvragen beantwoord
door ons onderzoek**

A white humanoid robot, identified as 'tēmi' on its chest, is holding a tablet. The tablet screen displays the text 'What do you think?' in white on a blue background. A woman wearing a red jacket and a gold bracelet is reaching out to touch the tablet. The robot's body is white with black accents on its joints. The background is slightly blurred, showing what appears to be a display or exhibition space.

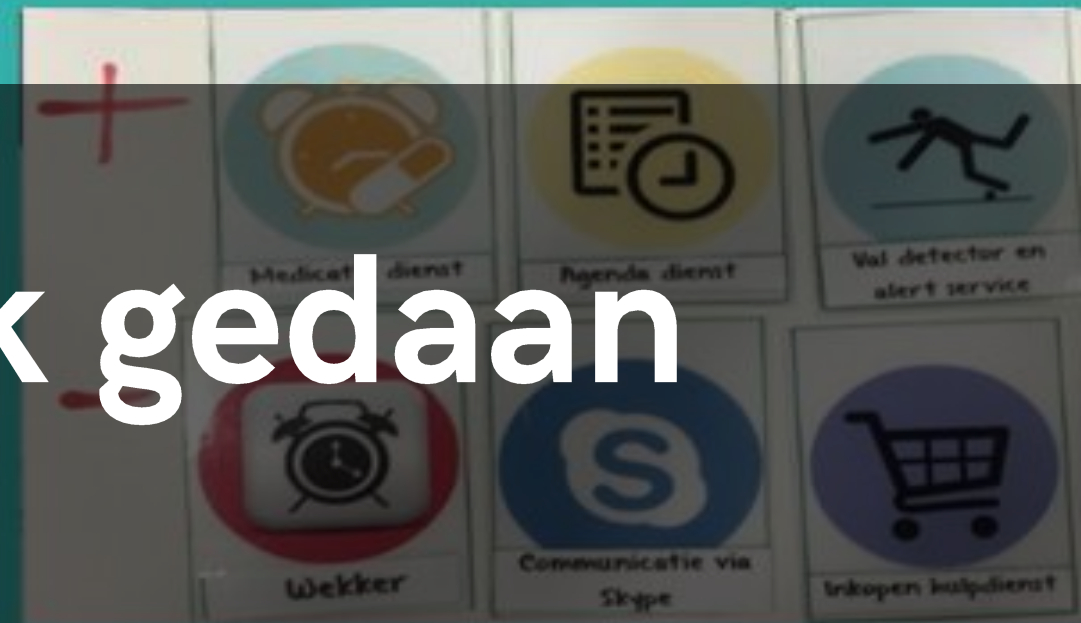
Vervangen robots menselijke dienstverlening?

Verandering van taken, geen vervanging, eerder versterking

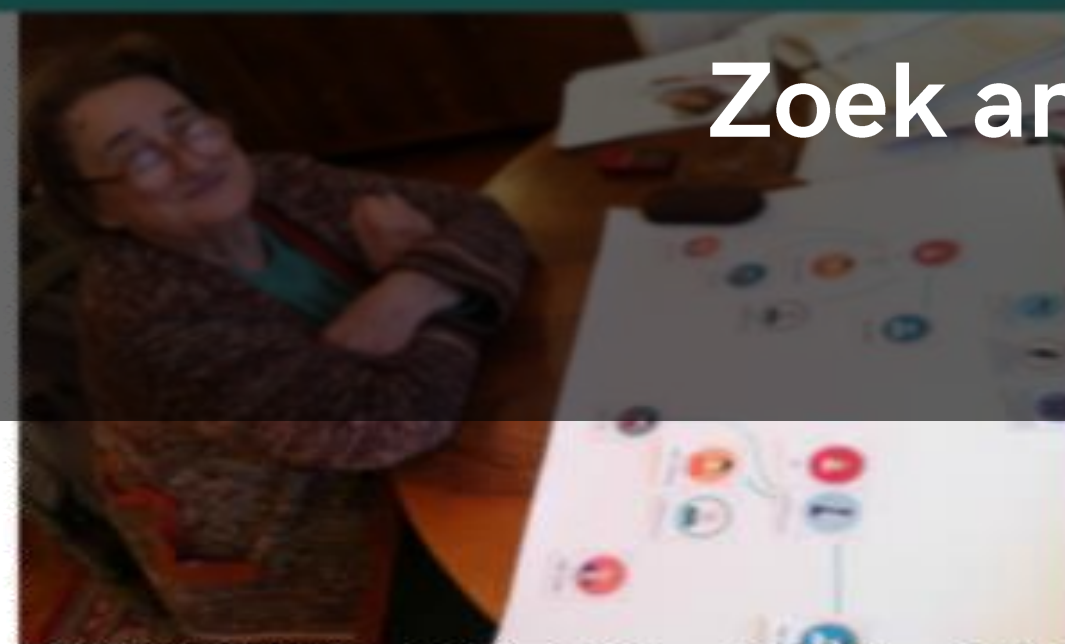
A close-up photograph of a white, rounded robot head. The robot's face is a blue screen displaying a simple, smiling face with large, circular eyes. The robot is wearing a brown, knitted scarf. The background is a blurred indoor setting with a window and some plants.

Hoe moeten robots er uitzien en werken?

Menselijke kenmerken werken positief, focus op functionele taken, maar ook als buddy



Hoe moet onderzoek gedaan worden?



Zoek antwoorden op niet gestelde vragen

A photograph of two women sitting on a wooden park bench outdoors. The woman on the left, wearing a light blue sweater and glasses, is holding a small, white, dome-shaped robot with a screen on its top. The woman on the right, wearing a pink jacket and a grey scarf, is looking at the robot with interest. The background is a blurred park setting with trees and a path.

Wat voegen mensen toe?

Verwachtingsmanagement, instructie van de robot, samenwerking met de robot, compensatie van beperkingen van de robot

Robot Ctrl / Photo credits: Peggy Maes



Kan de robot sociaal emotionele taken aan?

Is context specifiek: persoonlijke assistent, vriend, buddy

Wat zijn ethische vraagstukken rondom robots?

robot moraal, privacy, robot rechten



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Kerndomeinen en -inzichten



Onderwijs

Studenten die op afstand via de robot deelnemen aan de onderwijsgroep voelen zich meer betrokken en worden meer gezien

The service triad: an empirical study of service robots, customers and frontline employees

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<https://doi.org/10.1007/s11628-022-00499-4>

EMPIRICAL ARTICLE

Customer comfort during service robot interactions

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Abstract

Customer comfort during service interactions is essential for creating enjoyable customer experiences. However, although service robots are already being used in a number of service industries, it is currently not clear how customer comfort is ensured during these novel types of service interactions. Based on a 2×2 online between-subjects design including 161 respondents using pictorial and text-based scenario descriptions, we empirically demonstrate that human-like (vs machine-like) service robots make customers feel more comfortable because they increase rapport building. Social presence does not underlie this relationship. Importantly, we find that these positive effects diminish in the presence of service failures.

Keywords Service robots · Customer comfort · Rapport building · Social presence



Gastvrijheid

Robots werken samen met mensen in een driehoek van medewerker, klant en robot



Service robots: value co-creation and co-destruction in elderly care networks

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The current issue and full text archive of this journal is available on Emerald Insight at:
<https://www.emerald.com/insight/1757-5818.htm>

Mitigating loneliness with companion robots in the COVID-19 pandemic and beyond: an integrative framework and research agenda

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Mitigating loneliness with companion robots

1149

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Abstract

Purpose – Loneliness and isolation are on the rise, globally threatening the well-being across age groups; global social distancing measures during the COVID-19 crisis have intensified this so-called “loneliness virus”. The purpose of this paper is to develop an integrative framework and research agenda that can help to design companion robots in mitigating feelings of loneliness.

Design/methodology/approach – A netnographic analysis of 595 online visual and textual descriptions offer empirical insights about the role of the companion robot Vector during the COVID-19 pandemic.

Findings – The contributions of this study are twofold. First, it postulates that companion robots have the potential of mitigating feelings of loneliness (i.e. indicator of well-being). Second, this study contributes to transformative service by developing an integrative framework introducing the roles (personal assistant, companion, caregiver) that companion robots can fulfill to mitigate feelings of loneliness through

Welzijn

Robot kan gevoel van eenzaamheid mitigeren

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Service robots: value co-creation and co-destruction in elderly care networks

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BMC Health Services Research

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RESEARCH

Open Access



Analyzing the determinants to accept a virtual assistant and use cases among cancer patients: a mixed methods study

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Abstract

Background: Technological progress in artificial intelligence has led to the increasing popularity of virtual assistants, i.e., embodied or disembodied conversational agents that allow chatting with a technical system in a natural language. However, only little comprehensive research is conducted about patients' perceptions and possible applications of virtual assistant in healthcare with cancer patients. This research aims to investigate the key acceptance factors and value-adding use cases of a virtual assistant for patients diagnosed with cancer.

Methods: Qualitative interviews with eight former patients and four doctors of a Dutch radiotherapy institute were conducted to determine what acceptance factors they find most important for a virtual assistant and gain insights into value-adding applications. The unified theory of acceptance and use of technology (UTAUT) was used to structure perceptions and was inductively modified as a result of the interviews. The subsequent research model was triangulated via an online survey with 127 respondents diagnosed with cancer. A structural equation model was used to determine the relevance of acceptance factors. Through a multigroup analysis, differences between sample subgroups were compared.

Results: The interviews found support for all factors of the UTAUT: performance expectancy, effort expectancy, social influence and facilitating conditions. Additionally, self-efficacy, trust, and resistance to change, were added as an extension of the UTAUT. Former patients found a virtual assistant helpful in receiving information about logistic questions, treatment procedures, side effects, or scheduling appointments. The quantitative study found that the constructs performance expectancy ($\beta = 0.258$), social influence ($\beta = 0.114$), and trust ($\beta = 0.210$) significantly influenced behavioral intention. Self-efficacy ($\beta = 0.792$) acts as antecedent of effort expectancy. Facilitating conditions are found to have a significant relationship with user intention.

Conclusions: Performance and effort expectancy are the leading determinants of virtual assistant acceptance. The latter is dependent on a patient's self-efficacy. Therefore, including patients during the development and introduction of a VA in cancer treatment is important. The high relevance of self-efficacy suggests the need for a reliable, secure service.

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Ouderenzorg

Robot heeft positieve en negatieve kanten:

helper (+) / indringer (-), bondgenoot (+) / vervanger (-)

verlengstuk van zichzelf (+) / de-activeerder (-)



Maastricht Center for Robots:

Inzicht door verbinding tussen onderzoek, onderwijs en praktijk

<https://www.linkedin.com/company/maastricht-centre-for-robots/>

<https://www.maastrichtuniversity.nl/research/maastricht-center-robots>

Selected robot publications MCR

Phillips, C., Russell–Bennett, R., Odekerken-Schröder, G., Mahr, D., & Letheren, K. (2023). The Robotic-Human Service Trilemma: the challenges for well-being within the human service triad. *Journal of Service Management*.

Odekerken-Schroder, G., Mennens, K., Steins, M., & Mahr, D. (2022). The service triad: an empirical study of service robots, customers and frontline employees. *Journal of Service Management*, 33(2), 246–292. <https://doi.org/10.1108/JOSM-10-2020-0372>

Andrea Ruggiero, Dominik Mahr, Gaby Odekerken-Schroder, Tiziana Russo Spena and Cristina Mele (2022), “Companion robots for well-being: a review and relational framework”, In: Mark Davis (Ed.) *Research Handbook on Services Management*, Edward Elgar Publishing, Cheltenham, UK.

Becker, M., Efendić, E., & Odekerken-Schröder, G. (2022). Emotional communication by service robots: a research agenda. *Journal of Service Management*, Vol. 33 No. 4/5, pp. 675-687. <https://doi.org/10.1108/JOSM-10-2021-0403>

Becker, M., Mahr, D., & Odekerken-Schröder, G. (2022). Customer comfort during service robot interactions. *Service Business*, 1-29. <https://doi.org/10.1007/s11628-022-00499-4>

Martien J.P. van Bussel, Gaby J. Odekerken –Schröder, Carol Ou, Rachelle R. Swart, Maria J.G. Jacobs (2022), “Analyzing the determinants to accept a virtual assistant and use cases among cancer patients: a mixed methods study”, *BMC Health Services Research*, Vol. 22 No. 1, 1-23

Odekerken-Schröder, G., Mele, C., Russo-Spena, T., Mahr, D., & Ruggiero, A. (2020). Mitigating loneliness with companion robots in the COVID-19 pandemic and beyond: an integrative framework and research agenda. *Journal of Service Management*, 31(6), 1149–1162. <https://doi.org/10.1108/JOSM-05-2020-0148>

Čaić, M., Avelino, J., Mahr, D., Odekerken-Schröder, G., Bernardino, A. (2020). Robotic Versus Human Coaches for Active Aging: An Automated Social Presence Perspective. *International Journal of Social Robotics*, 12, 867-882. <https://doi.org/10.1007/s12369-018-0507-2>

Mahr, Dominik, Caic, Martina, & Odekerken-Schröder, Gaby (2020). An interdisciplinary view of marketing ethics. In *The SAGE Handbook of Marketing Ethics* (pp. 58-73). London: SAGE.

Čaić, M., Mahr, D., & Odekerken-Schröder, G. (2019). Value of Social Robots in Services: Social Cognition Perspective. *Journal of Services Marketing*, 33(4) 463-478. <https://doi.org/10.1108/JSM-02-2018-0080>

Čaić, M., Odekerken-Schröder, G., & Mahr, D. (2018). Service robots: value co-creation and co-destruction in elderly care networks. *Journal of Service Management*, 29(2), 178–205. <https://doi.org/10.1108/JOSM-07-2017-0179>

Čaić, Martina, Stefan Holmlid, Dominik Mahr, Gaby Odekerken-Schröder (2021), Design of Robotic Care: Ethical Implications of a Multi-actor Perspective, In Mario A. Pfannstiel Nataliia Brehmer, Christoph Rasche (Eds.), *Service Design Practices for Healthcare Innovation*, 381-398, Springer