

# Next step: Manizales! Staging a Co-Drive journey between Italy and Colombia

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## ABSTRACT

The Co-Drive situated action within PDC2020 is an intergenerational intervention between elderly people in Rome, Italy, and younger adults in Manizales, Colombia, and vice versa, which consists of experiencing a car journey together through VR and telepresence technologies. We stage a series of Co-Drive journeys as a rehearsal of a possible service enabled by autonomous cars, looking at such technology beyond safety, efficiency and driving functionality. In particular, we aim to probe if autonomous cars could provide a social context for new intergenerational encounters in the shape of a shared car trip. We will set-up the prototypes of the technological equipment both in Manizales and Rome so that people could enact the Co-Drive journey between Colombia and Italy. By rehearsing the experience in-context, we aim to prompt participants to fill the gaps of what the Co-Drive service, as well as automated driving technologies, might be in the future and mean for them.

## Author Keywords

Participatory design; automated cars; intergenerational encounters; remote travel; telepresence.

## INTRODUCTION

Since its early phases, the development of automated vehicles has been focusing on functionality, safety and efficiency aspects, overlooking the social implications that such technology would bring up in people's lives. Social scientists have recently suggested opening up the discourse on automated driving through the mobilities approach [1], which explores the technical and the social domain as relationally constituted and re-positions the relationship between people and cars beyond being a mere transportation system, yet a "way of life" [8]. They suggest that new social interactions are going to emerge as we transition towards automated vehicles and the car becomes much more a "dwelling space" [7] always connected to the outside environment through the web [9]. From a design research

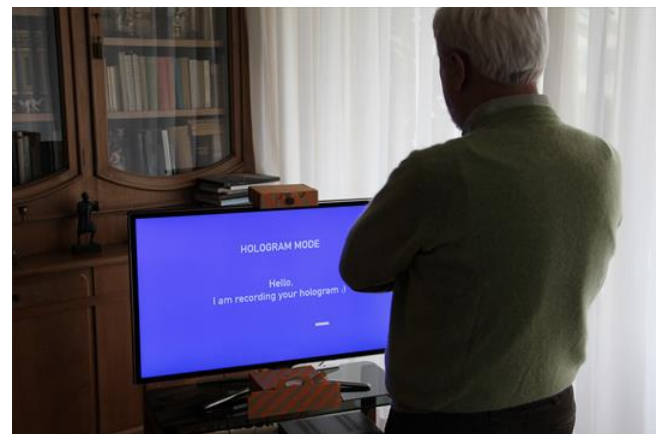
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perspective, the combination of the technical and social possibilities enabled by automated driving opens up a new design space where to ground the explorations of new mobilities-related services. In this paper, we introduce the Co-Drive concept as a service grounded in such a design space where automated driving means not only to remove the driving task from the driver, but also implies the possibility to tele-operate the vehicle and to craft particular infotainment systems linked to traveling by car. We suggest a situated action as a methodology to inquiry the Co-Drive possible future by enacting it in context [5].

## THE CO-DRIVE SERVICE FOR INTERGENERATIONAL ENCOUNTERS

Co-Drive is a new service for traveling and socializing by car between a driver of an automated vehicle and a remote passenger connected via virtual reality from home. As a projection on the windshield, the driver can see the remote passenger waiting at a Co-Drive stop and can decide to pick her/him up. The remote passenger will be hosted as a hologram inside the car. The hologram will be recorded at home by the passenger (Figure 1), even if the concept is still open to different kinds of virtual and robotic embodiments [6]. The passenger will be physically at home and will be picked up by the driver at a Co- Drive bus stop located in the city (Figure 2).



**Figure 1. Hologram recording.**

The passenger will be joining the car trip by wearing a VR headset. Passengers will also have the opportunity to take the driving lead from home and tele-operate the car (Figure 3). A video scenario of the service has been sketched out and is available online [2]. The Co-Drive concept aims to foster

new social interactions, such as intergenerational encounters, as remote passengers could likely be elderly people with reduced mobility or limited occasions to travel. We look at the autonomous car as a potential stage for encounters where older and younger adults meet and interact within the context of a shared car trip. Cars have been extensively acknowledged as mobile dwelling spaces where peculiar social relationships are enacted between family members, friends and even strangers [7].



**Figure 2 on the left. Passenger pick-up. Figure 3 on the right. Remote driving by the remote passenger (with VR headset).**

We argue that the convergence of automated driving and telepresence technologies could provide a new social context for previously inconceivable personal interactions to emerge, that are neither dependent on any earlier relationships nor based on age affinities. A first low-fidelity experience prototype of the Co-Drive service was performed some months ago, which involved some elderly people from Rome and a driver from a faraway city in Northern Italy [3], and had given us enough trust to pursue the concept further and iterate the prototype towards a higher fidelity one and joining people from different countries, as we are now suggesting as a situated action at PDC2020.

### **STAGING THE JOURNEY**

We propose to stage Co-Drive journeys between the cities of Rome (Italy) and Manizales (Colombia) during the days of the PDC 2020 conference. Elderly participants from Rome will have the chance to turn into remote passengers inside a special car in Manizales which will be equipped with the prototyped technology. Local people will participate as car drivers and will be driving the remote passengers throughout the city of Manizales. The same experience can be performed in reverse between elderly participants in Manizales as remote passengers and drivers located in Rome during different days of the conference.

### **People involvement**

The group of elderly participants in Rome attends the elderly day care "Nuova Socialità". The group in Manizales will be locals with driving licence who know the city and its streets very well. Speaking Italian would be a plus but not required (in case a translator in Rome may be enrolled). Elderly participants in Manizales are not agreed at the time of this proposal. The recruitment of people in Manizales will be promoted through the PDC organizing committee, the dedicated website of the project [4], the Istituto della Cultura Italiana in Bogotá, the Universities in Manizales.

### **Protocol**

Participants will be briefed about the Co-Drive concept and about the technology set-up at the time of recruitment. During the situated action, they will be invited to behave naturally and speak to each other as they experience this particular kind of car trip together. Each driver will be randomly paired by the researchers with a remote passenger. At the given time, the driver, with the technology equipped car, will pick the remote passenger up at the local Co-Drive stop and from that moment their Co-Drive trip will begin. They will be asked to return within an hour. The drivers and remote passengers will need to agree among themselves about the route to go, as no previous agreements have been taken at the time of recruitment. A researcher will be shadowing the experiment inside the car and a Go-pro like camera will be placed to stream and record the experience.

### **Times and places**

Due to different time zones, the situated action will take place on established conference days from 10 am to 12 am, Manizales time (GMT-5). Co-drive journeys will follow a pre-arranged schedule, each one lasting for a maximum of an hour. A Co-Drive stop will be physically arranged in the urban space next to the PDC 2020 conference venue. Each journey will start from the Co-Drive stop by the driver picking up the remote passenger. The remote passenger will be physically in Rome, at home or at the day care center. Her/his avatar instead will be waiting at the Co-Drive stop. A similar arrangement will be agreed for the journey of Manizales elderly participants and drivers in Rome.

### **Technology set-up**

There will be two technology set-ups, one in the location A with the moving car, and one in the location B with remote passengers. The location A set-up involves equipping a regular car with prototypes so to enable the live streaming of the car view from the windshield, as well as voice communication. We aim to provide an in-car representation of the remote passenger, as her/his own embodied agent. The location B set-up instead involves providing the elderly person with a head-mounted display transmitting the live streaming from the car in location A. Two researchers will manage the set-up of the prototypes and run the action respectively in Manizales and Rome. Instead, in the PDC2020 exhibition area, the Co-Drive video scenario [2] will be played as well as the situated action will be streamed on the days it will be occurring.

### **Reflections**

Upon the agreement with the participants, the two researchers will be shadowing and video recording the action in Rome and inside the car in Manizales. At the end of each car trip, the researchers will interview the participants about the experience and the meaning of such a shared car trip to them.

### **REFERENCES**

- [1] David Bissell, Thomas Birtchnell, Anthony Elliott, and Eric L Hsu. 2020. Autonomous automobilities: The

- social impacts of driverless vehicles. *Current Sociology* 68, 1 (2020), 116–134. <https://doi.org/10.1177/0011392118816743>
- [2] Laura Boffi. 2018. Co-Drive. Video. (Mar 2018). Retrieved March, 2020 from <https://vimeo.com/259302417>
- [3] Laura Boffi, Philipp Wintersberger, Paola Cesaretti, Giuseppe Mincoletti, and Andreas Riener. 2019. The first co-drive experience prototype. In Proceedings of the 11th International Conference on Automotive User Interfaces and Interactive Vehicular Applications: Adjunct Proceedings (AutomotiveUI '19). Association for Computing Machinery, New York, NY, USA, 254–259. DOI:<https://doi.org/10.1145/3349263.3351318>
- [4] CO-DRIVE Situated Action — Cars with an Intent. *Cars with an Intent*, 2020. <https://carswithanintent.com/situated-action>.
- [5] Joachim Halse and Laura Boffi. 2016. Design Interventions as a Form of Inquiry. Bloomsbury.
- [6] Konstantina Kilteni, Raphaela Groten, and Mel Slater. 2012. The sense of embodiment in virtual reality. *Presence: Teleoperators and Virtual Environments* 21, 4 (2012), 373–387.
- [7] Eric Laurier and Tim Dant. 2012. What we do whilst driving: Towards the driverless car. *Mobilities: New perspectives on transport and society* 223 (2012).
- [8] J. Urry. 2007. *Mobilities*. Wiley.
- [9] John Urry. 2008. Governance, flows, and the end of the car system? *Global Environmental Change* 18, 3 (2008), 343–349.