

Coach Assistant via Projected and Tangible Interface

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Call:	H2020-SC1-2017-CNECT-1					-	
Funding scheme:	RIA 769830 CAPTAIN						
Proposal number:							
Proposal acronym:							
Duration (months):	36						
Proposal title: Coach Assistant via Projected and Tangible Interface							
Activity:	SC1-PM-15-2017 RIA	•					
Ν.	Proposer name	Country	Total Cost	%	Grant Requested	uly user-center	
1 ARISTOTELIO P	ANEPISTIMIO THESSAI ONIKIS	FI	650 000	16 29%	650 000	,	

Evaluation Summary Report

Evaluation Result

Total score: 15.00 (Threshold: 12)

Form information

SCORING

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Scores must be in the range 0-5.

Interpretation of the score:

- 0 The proposal fails to address the criterion or cannot be assessed due to missing or incomplete information.
- **1** Poor. The criterion is inadequately addressed, or there are serious inherent weaknesses.
- 2 Fair. The proposal broadly addresses the criterion, but there are significant weaknesses.
- 3 Good. The proposal addresses the criterion well, but a number of shortcomings are present.
- 4 Very good. The proposal addresses the criterion very well, but a small number of shortcomings are present.
- 5 Excellent. The proposal successfully addresses all relevant aspects of the criterion. Any shortcomings are minor.



Excellence evaluation



Objectives of the proposal are clear and pertinent to the call, addressing all of the expected objectives mentioned in the work programme.

The concept of the proposal is sound, attractive and promising and the proposed methodology is appropriate to meet technical objectives of the proposal. End users and caring operators are well involved throughout the project's lifetime, at design, development and evaluation stages. Key performance indicators with concrete targets to be achieved are presented.

The state of the art is clearly detailed. The proposed work will clearly advance beyond the state-of-the art in some areas such as emotional and behavioural pattern analysis. The developed coach would be highly innovative.

Interdisciplinarity is carefully taken into consideration in the proposal. The stakeholder knowledge is used at design and testing stages, due to the participation of different medical and caring entities.

Impact evaluation

The project will contribute to the expected impacts mentioned in the work programme. Key performance indicators and metrics for impact assessment are present, in particular for measuring the cost effectiveness.

The proposal reports a detailed description of most of the dissemination activities and of the contribution of each partner to those activities, however, the scientific dissemination is not sufficiently detailed. The foreseen communication with the scientific community at the international level, with the industrial community by approaching relevant SMEs and with the healthcare stakeholder (nurses, cares, etc.) as well as with the general public and policy makers is very good. Exploitation is well addressed, with a preliminary analysis of the market, a SWOT analysis and an embryonic business model. Individual exploitation is also taken into account in sufficient detail. The approach for IP and knowledge management is well described.



Implementation evaluation

Overall, the work plan is very carefully planned and highly effective to implement the proposed project. The individual work packages are well elaborated, detailed and the assigned resources are coherent with the stated objectives and the planned deliverables. The interlinkages between WPs are properly described and the timetable and the planned milestones are realistic. However, the technologies needed for measuring some specific behaviour are not sufficiently described in WP5.

Project management structures and procedures are well defined and effective. It is good that the proposal has already appointed an experienced project manager. Risk identification and mitigation mechanisms are sufficiently elaborated. Innovation management is appropriately described.

The consortium is a multi-disciplinary team that includes partners from academia, research and business communities, funding initiatives as well as living lab and citizen communities, which as a whole has credible experience.

The tasks are appropriately allocated and all participants have a valid role and adequate resources to fulfill their role in the project.



The competition



















CAPTAIN H2020 PM-15 project

nively s











HoloCa

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The food is ready. Turn off the oven.



Today is your daughter's birthday. Call her

Chapter 1

-0000-

It is a truth universally acknowledged,

However little known the feelings or

that a single man in possession of a good

views of such a man may be on his first

entering a neighbourhood, this truth is so

well fixed in the minds of the surrounding

families, that he is considered the rightful

property of some one or other of their

him one day, "have you heard that Nether-

Mr. Bennet replied that he had not.

"Dut it is " estimated that "for hit

"My dear Mr. Bennet," said his lady to

fortune, must be in want of a wife.

Jane Austen

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daughters.

field Park is let at last?"

Library

all about it."

Mr. Bennet made no answer. "Do you not want to know who has

taken it?" cried his wife impatiently. "You want to tell me, and I have no objection to hearing it."

Pride and Projuctice * A Q D

This was invitation enough.

"Why, my dear, you must know, Mrs. Long says that Netherfield is taken by a young man of large fortune from the north of England; that he came down on Monday in a chaise and four to see the place, and was so much delighted with it, that he agreed with Mr. Morris immediately; that he is to take possession before Michaelmas, and some of his servants are to be in the house by the end of next week." "What is his name?" "Bingley."

"Is he married or single?"

CAPTAN H2020 PM-15 project I am the Captain and I welcome you on board!!!











Archangelos Michae Elderly People ספועח

HoloC



Rewind





31 January 2017 17:00:00 Brussels time





5 months before the deadline



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- Initially we were 5 partners
- Friend partners that we want to work together because we know each other and we like each other





To find a good and innovative idea based on the call's text



Specific Challenge

The activity aims at developing and validating **radically new ICT** based concepts and approaches for empowering and motivating **people in need of guidance and care due to age related conditions**, in cooperation with their carers where relevant, and to help them improve and maintain their independence, functional capacity, health status as well as preserving their physical, cognitive, mental and social well-being.







The "coach" should provide **personalised advice**, guidance and followup for key age related issues in daily life which impact the person's ability to remain active and independent, for example diet, physical activity, risk avoidance, preventive measures, lifestyle and activity management, leisure, social participation and overall wellness. The goal should be to **preserve physical, cognitive, mental and social well-being** for as long as possible and to facilitate interaction with carers (where relevant).







Proposals should address relevant **ethics** and gender aspects and should also assess related legal and regulatory questions such as ownership of data, data protection/privacy, liability and consumer protection. It is crucial that **users are involved and drive the innovation at all stages of design and development, including user acceptability, satisfaction and impact in realistic settings**.



Expected Impact

- Usefulness and effectiveness of personalized recommendations and follow-up in terms of the goals of preserving physical, cognitive, mental and social well-being for as long as possible;
- Validation of non-obtrusive technology for physical, cognitive, social and mental well-being;
- Evidence of user-centred design and innovation, new intuitive ways of human-computer interaction, and user acceptance;
- **Potential cost-effectiveness** due to enhanced self-care, life-style and care management.





- 4 months later we end up with the idea of micro-projectors within the living environment after we went through\
- Smart glasses, to read emotion from your face reflection to mirrors
- The conventional smart home that measure as much as it can and then provides basic interaction with a smartphone app
- Virtual reality through wearable devices
- Etc.



The challenge

- We had 1 month left to write the proposal
- Full time job
- Partners tailored to the main idea
- Partners with experience in writing grants





Once we had a crystal clear idea....

- We wrote the first 2 pages of the application, the most important part, as it is the first text the evaluators read and either they like it or not
- It must be short, comprehensive setting the problem, main objective, setting the vision of the proposal as well as setting the main pillars the proposal will be built upon.
- These pillars could principles, the components, the devices, etc. Something concrete that replies to the call's objectives and run the proposal in all sections.



The main component of the CAPTAIN proposal

- Projected augmented reality
- Real-time 3D sensing technologies transforming the environment into a ubiquitous tangible interface
- Sensing behaviour of the adults
- Non-invasive physiological and emotional data analysis
- contextualized and personalized coaching through a motivational engine



The main objectives

- prototype of home device including all input technologies necessary to turn the home into an intelligent environment.
- true projective, tangible and emotional HCI Human Computer Interfaces (by HOL).
- non-invasive collection and analysis of emotional, behavioural and physiological data (by NVISIO).
- non-invasive collection and analysis of movement and gait data (by NIVELY and AUTH).
- engaging forms of physical and cognitive training (by AUTH).
- personalised motivational coach ready to intervene wherever and whenever needed (by SAL and VICO).
- Maximise usability and acceptance of the system through co-designing of the entire system with the involvement of older adults at all stages of the project (by AUTH).










1.1 Objectives

#	Objective (O)	Key Performance Indicators (KPIs)
	Scientific and technical objectives	
O#2	To dynamically monitor older adult's behavioural change through unobtrusive behavioural data sensing . CAPTAIN, in <u>order to</u> sufficiently and effectively provide information wherever needed, tracks the user's indoor activity and location (T4.3). <u>This</u> <u>information</u> , will be combined with data collected while carrying out tasks in the context of games (T4.4	KPI2.1 : number of new detected features (>10) KPI2.1 : Perceived sense of unobtrusiveness when regarding the interface (>80% of users)
	Operational	
O#7	To adopt a co-creation methodology for agile requirements elicitation and validation of development . Relying on the living labs' power, the project stakeholders (users/seniors, carers, living labs staff, clinical staff, etc.), constituting the "Stakeholders' network", will be the only official source of requirements. Established in T.2.1, this network will run throughout the project's lifecycle and	KPI7.1: involvement of 20 older adults in the co-design of the system.KPI7.2: involvement of 8 caregivers in the co-design of the system.KPI7.3: involvement of 6 clinicians in the co-design of the system.
	Dissemination, awareness and exploita	ition
O#9	To create a community of stakeholders. To promote wide adoption of CAPTAIN, the project will liaise with the scientific community at the international level through workshops, with the industrial community by approaching relevant corporates and SMEs, with the healthcare stakeholder (nurses, cares, etc.) as well as with the general public and policy makers. In addition, the CAPTAIN open API community will be built around the CAPTAIN open API (O#6) participating also in the FIWARE and universAAL communities.	 KPI9.1: number of presentation at scientific events (>40) KPI9.2: number of meetings with companies (>30) KPI9.3: number of meetings with caregivers or healthcare experts (>20) KPI9.4: number of researchers from institution involved in FIREWARE or universal involved in targeted actions (>20).



 Table 1: General objectives and Key Performance Indicators (KPIs)





a alamy stock photo

FT11WR www.alamy.com

What else can fit in the 1.1 Objectives section?

A narrative scenario, demonstrating how the *scenario*, demonstrating how



Dreamstime.com

1.1.2 Example of a typical day with CAPTAIN

The following scenario illustrates, through a set of practical examples, the typical scenario CAPTAIN will address in the context of occupational and rehabilitation therapies of people with memory impairments, to **empower** users by helping them develop, recover, or maintain the skills necessary for their activities of daily living.

11:30 AM

John, 65-year-old, gets back home after a visit to his physiotherapist necessary to recover from the consequences of a fall which occurred three weeks earlier. As soon as he gets back home, CAPTAIN detects his presence (through the CAPTAIN unit installed in the hall of his house). John takes off his coat and sits on the sofa in the living room to rest. His personal coach appears next to him and welcomes John back home, asking whether he visited the physiotherapist. Despite the furniture and the corners of the room, the image of his personal coach is perfectly visible from John's point of view as if standing next to him. John answers affirmatively and asks the coach about his daily schedule.



The coach tells John that he first needs to prepare his lunch and shows, on the small table next to him, two choices. John selects the preferred option by touching the corresponding image projected on the table. The coach then suggests to go to the kitchen and check if all ingredients are available.

As soon as he enters the kitchen he can see the list with the required ingredients projected on the fridge, based on a pre-defined nutrition plan designed by John's nutritionist that is helping him to control weight, glucose levels and a blood pressure in the recommended limits.



Applesercol: Dreamstane.com

Target user & needs targeted (what's in it for them)

General needs and how these are addressed by CAPTAIN
• Estimation of gait and balance. Risky situations (e.g. the older adult just stood up
from the sofa and lost her/his balance) trigger self-guidance to prevent adverse event.
• Long term analysis of gait and balance patterns. Long-term data is used to inform
the users or caregivers about the location in the house where the risk of fall is increased
(where the balance is lost most of the times). This information could be used to change
layout of the interior of the house to prevent falls.
 Playful engagement in physical and cognitive training. New gamified approaches are proposed through validated serious games which are delivered within the environment without the need for interacting with specific devices (e.g. a pc or tablet). Increase adherence levels. Social impact campaigns (asking the seniors to donate their collected gaming points to activities with social impact) will increase the
adherence levels turning physical and cognitive training into the means and not the goal.
 Increase engagement with friends. The coach and its gamification approach guides the seniors to continuously engage in cooperative or competitive activities through games with their friends. Once the system detects the senior's preferences, CAPTAIN promotes more cooperation or competition accordingly. CAPTAIN projects every time the most proper contacts to call next to its activity (i.e. during cooking her/his daughter call icon is presented). Provide links to real life. CAPTAIN exploits gaming campaigns with social impact



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Challenges and how they are addressed by your proposal

1.1.4 How generic and specific goals will be addressed by CAPTAIN

Macro objectives	CAPTAIN proposed solution
1. Creation of a prototype of	A prototype of home appliance, functioning as different series of lamps (for
home device that can turn the	mounting at the ceiling, on the wall or under cabinet), will be prototyped including
home into an intelligent	all the sensing (3D sensors, microphone, cameras) and output devices (micro-
environment	projectors loudspeaker, etc.) within a single device.
2. Creation of a true	CAPTAIN adopts and builds upon the Hololamp device and its concept of
projective, tangible and	projected augmented reality. Micro-projectors project any type of information
emotional HCI - Human	wherever and whenever needed while 3D sensors are used to understand the space
Computer Interfaces	(in order to project a properly adjusted image that will appear correct in the real
	world) and to capture gestures of the users. Thus, any surface of the home can be
	turned into a tangible User Interface facilitating the senior's guidance and activity.
3. Development of	CAPTAIN analyses images captured from micro-cameras, to detect facial micro-
technologies for non-invasive	expressions, body pose as well as adherence to the provided guidance. This
collection and analysis of	information is used to continuously update the senior's profile patterns. In
emotional, behavioural and	addition, CAPTAIN facilitates the communication of measurement of
physiological data	physiological devices by projecting an intuitive interface for medical records on
	the table next to the senior after a measurement has been taken.
4. Development of	CAPTAIN tracks the real-time location of the seniors from the 3D sensors which
technologies for non-invasive	will be used to identify seniors' movements and gestures.
collection and analysis of	
movement and gait data	



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1.2 Relation to the Work Programme

🔪 🛛 SEARCH FUNDING & TENDERS 🔻 HOW TO PARTICIPATE 🔻 PROJECTS & RESULTS 🛛 WORK AS AN EXPERT SUPPORT 💌

Oct 14, 2015

Personalised coaching for well-being and care of people as they age

ID: SC1-PM-15-2017

Topic Description

Topic Updates

Topic description

Conditions and documents

Submission service

Get support

Call information

Call Updates

Specific Challenge:

The activity aims at developing and validating radically new ICT based concepts and approaches for empowering and motivating people in need of guidance and care due to age related conditions, in cooperation with their carers where relevant, and to help them improve and maintain their independence, functional capacity, health status as well as preserving their physical, cognitive, mental and social well-being.

Scope:

Proposals should develop a proof of concept of radically new solutions for a personalised "virtual coach", building upon intelligent ICT environments, access to relevant physiological and behavioural data, new forms of accessible interaction based on tangible user interaction concepts, open platforms^[1] and emotional computing. Usability and ease of user interaction should be essential design elements of the "coach".





Every word counts

Specific Challenge:

The activity aims at developing and validating radically new ICT based concepts and approaches for empowering and motivating people in need of guidance and care due to age related conditions, in cooperation with their carers where relevant, and to help them improve and maintain their independence, functional capacity, health status as well as preserving their physical, cognitive, mental and social well-being.

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1.2 **Relation to the work programme**

CAPTAIN targets "SC1-PM-15-2017: Personalised coaching for well-being and care of people as they age", and it addresses its specific challenge as follows (note: quotes from the work programme are followed by explanations):

The activity aims at developing and validating radically new ICT based concepts and approaches for empowering and motivating people in need of guidance and care due to age related conditions, in cooperation with their carers where relevant, and to help them improve and maintain their independence, functional capacity, health status as well as preserving their physical, cognitive, mental and social well-being.

CAPTAIN proposes an assistive environment adopting radically new ICT based solutions (O#1) in the home of an elderly person (O#8) and investigates how feasible such a system will be through real trials involving older adults and caregivers. Trials will be essential to assess the degree this new technology will be effective to support daily lives of elderly people, by delivering an interaction experience that is comfortable, effective and intuitive (O#4).

To this extent CAPTAIN proposes a user-centric solution aimed at supporting independent living at home through assistive and transparent ICT technologies designed to turn the home of the older adult into a ubiquitous assistant designed to offset their memory impairments, as well as the tightly related deterioration of physical health and emotional well-being, during activities of daily living, including:

- <u>Perform daily tasks and activities</u>, (e.g., house cleaning, hygiene, cooking) by leveraging on "projected augmented reality" to project contextualised information and instructions on top of the real environment to empower the user to make them independently carry on ADL.
- <u>Remember actions</u> (e.g. measure blood glucose level or continue forgotten actions) through intelligent feedback by the environment they live in; through use of 3D sensing technologies, older users will always be able to see and follow the instructions, without requiring any additional device to be wore nor any step to specifically interact with the system.
- <u>Monitor health status</u>, through camera-based non-invasive detection of emotional, behavioural, physiological (based on analysis of skin surface and its micro movements) and social aspects.

[Addressed by O#1, O#2, O#3, O#4, O#8]



Proposals should develop a proof of concept of radically new solutions for a personalised "virtual coach", building upon intelligent ICT environments, access to relevant physiological and behavioural data, new forms of accessible interaction based on tangible user interaction concepts, open platforms and emotional computing.

CAPTAIN aims at offering assistance through a very comfortable, intuitive, transparent yet effective interaction paradigm: by transforming the home itself into a transparent and **tangible interface** (O#1) where instructions of the virtual coach are **projected** onto the real context augmenting it <u>when and where needed</u> (O#4), while interaction with the virtual coach occurs by touching or moving real life objects. The CAPTAIN system will introduce radically new tangible interaction means that emphasize both in unobtrusive sensing of the daily living environment (O#2) and introducing home augmented reality by turning indoor appliances, walls and furniture into interactive and tangible surfaces. Such a solution has been barely applied before to health care settings.

- <u>Non-invasive physiological and emotional data recording</u> from facial micro-expressions which are captured and analysed thanks to scalable, robust, and accurate deep learning 3D facial imaging technologies by partner NVISO, compatible with ordinary webcams and mobile phones, so to measure instantaneous emotional state; <u>also</u> voice can be exploited for estimating the state of mind of the patient. Moreover, traditional methods for heart rate, blood pressure, blood oxygen saturation will be blended with new intuitive ways (i.e. tangible user interface on the table) for communicating these measurements to the CAPTAIN system.
- <u>Non-invasive behavioural data collection</u> through real-time location of the patient from 3D sensors, which will be used to identify seniors' movements and gestures (interaction patterns):
 - By NIVELY to detect possible dangerous situations (such as wondering or falling) and analyse the social significance of the senior's behaviour.
 - By AUTH to create personalised physical and cognitive training through serious games that will features in-game metrics and progress.

[Addressed by O#1, O#2, O#4]



1.3 Concept and Methodology

- The need (numbers and figures that justify the value of the impact of the solution)
- The solution, going from the abstract concept down to the main components that composed our solution. How the components are work together (architecture). User clear simple figures.
- Description of the each components on the technical implementation (providing the inputs and outputs) as well as any technical details (and which partner will contribute with previous expertise/knowledge)





1.3.1 The Need

According to Eurostat¹ data (June 2016) in 2015, 18,9% of the EU-28 population (508,5 million) was aged 65+, with an increase of +0,4% if compared to the previous year and an increase of +2.3% compared to previous 10 years. EU-28 population will continue ageing from 2015 to 2080. Most importantly, the share of so-called "very old" (i.e. aged 80+) will the fastest societal group², doubling its share from 5.3 % (in 2005) to 12.3 % (in 2080). This trend will be the result of a prolonged life expectancy and subsequent average age increase. This trend, although with varying figure, is a global tendency and it will cause a larger number of older adults to be in need of assistance from a <u>fast shrinking</u> younger population share. In particular, it is predicted that the number of <u>old people suffering memory impairments</u> will more than double over the next 30 years³.

Several studies have highlighted that designing technologies that explicitly take into account older users should be seen as one of the most important tasks. In addition to designers' ability to make products more desirable for any given market, a dedicate design can potentially improve older people's quality of life (Rogers & Czaja 2004). Conversely, poorly designed technology is one of the <u>cause</u> of fear of technology among the older adults (<u>Charness</u> & Boot, 2009) requiring high cognitive workload even for simple tasks, turning therefore technology into an <u>attention grabbing</u> barrier rather than a facilitating tool.

The goal of CAPTAIN is to offer assistance through a very comfortable, intuitive, transparent yet effective





interaction with the senior, their habitual social connections, the informal caregivers, including the
relatives, and the formal caregivers. <u>Thus</u> empowering real-life social interactions.

promotion of interaction between different users with the same pathologies.

Finally, in order to ensure integration with existing IT ecosystems and maximise interoperability, CAPTAIN will develop an **open source API** (Application Programming Interface) (O#6) for integration with FIWARE and universAAL. This way, through the API it will be possible to access existing building blocks and expose all the CAPTAIN's functionalities (inputs, output, intermediate inferences and algorithms results) to third party solutions (both research projects or commercial products) (O#9).

With regard to integration with FIWARE, CAPTAIN will adopt Generic Enablers (GE) as well as Specific Enablers (SE) coming mainly from the FI-STAR catalogue (Note: staff from NIVELY were involved in FI-STAR). Moreover, a wrapper of the CAPTAIN API will be designed as an FIWARE Enabler to allow its adoption through other FIWARE solutions. With regard to integration with universAAL, CAPTAIN will comply with it so that other application rolled-out on top of universAAL can adopt CAPTAIN seamlessly.





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Non-invasive movement and gait data analysis



Movement and gait analysis will rely on use of range cameras (by Nively) which operate as a real-time 3D scanner using the MentorAge technology by Nively (see TRL in Table 3). The system is able to extract in real time the position of the persons in the room and of their body parts (i.e. head, torso, arms, legs) through use of a 3D sensor (the range camera) and its body configuration in order to detect conditions of risks (e.g. a person falling or subject to a night wandering episode). By applying the Density-Based Spatial Clustering (DBScan) algorithm, it will be

possible to produce High Density Regions (HDR), which is the locations the senior spends most of her/his time. These extracted locations will be aggregated (e.g. on a weekly, monthly basis) to provide aggregated and more meaningful insights on the senior's lifestyle patterns. Users' movement will be analysed according to the followed route (from which HDR to which HDR) in order to derive gait and balance analysis beyond averages by adding as parameter the route (https://www.youtube.com/watch?v=VVk7oiv2N2Y). The seniors balance, as well as posture and gestures, will be inferred/calculated based on the body's footprint captured by the ceiling camera.

Real time execution and extraction of the senior's position, posture and looking direction extracted from range cameras will be fed to the CAPTAIN system to project the content at the right place when needed.

Physical and cognitive training through serious games



The CAPTAIN's physical and cognitive training will be supported and promoted by AUTH's physical and cognitive serious games platform webFitForAll (see Table 3). webFitForAll has been tested with more than 200 elderly participants (healthy and with Mild Cognitive Impairment), exhibiting good efficacy and usability assessment as well as high adherence (82%) to a daily schedule. Designed and developed tailored to

the seniors, its architecture introduces standard physical exercise protocols in exergaming software engineering, as well as, standard physical assessment tests for augmented adaptability through adjustable exercise intensity. For instance, one of the main games CAPTAIN builds upon, is a hiking game (see scenario in 1.1.2) where the game logic calculates the steps and changes the images of Google Street View giving the perception to the user that s/he walks in a city or village.

In line with current trends and market needs, webFitForAll is based on HTML5, JavaScript and CSS3 consuming web service (SOAP and REST), web sockets and WebGL. This architecture boosted the usability and user experience that influence the attitude towards technology use by elders. Additionally, webFitForAll can use IoT devices to incorporate physiological measurements as part of the game (e.g. glucose levels measure earns game points) in order





MEDICAL PHYSICS LABORATORY

School of Medicine, Aristotle University of Thessaloniki

Project Methodology





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The positioning of the project

Table 3 TRL for CAPTAIN technologies

Pre-existing	TF	RL			IDEA Unproven concept, no testing has been perfor
technology and owner	Start	End	Justification	1	BASIC RESEARCH
Datasets Player			The Datasets Player by AUTH (http://www.cac-framework.com/app and video at youtu.be/XLneU8O9WU8) allows offline playback of collected datasets coming from different channels. This allows reproducing/replaying all the collected datasets of a pilot	2	TECHNOLOGY FORMULAT Concept and application have been formulate
(AUTH)	6	8	as if the pilot was conducted in that moment. The playback API will be extended further within and after the CAPTAIN project lifecycle to support new databases and new	3	Vou have an initial 'offering': stakeholders like
HoloI amp			channels. HoloI amp is the world's first glasses-free and hands-free portable augmented reality	4	SMALL SCALE PROTOTYP Built in a laboratory environment ("ugly" prob
(HOL)	7	9	device that creates optical 3D illusions directly on your environment.	5	LARGE SCALE PROTOTYP
webFitForAl	8	9	large scale pilot trials with more than 400 seniors for 2 months. It delivers standard physical and cognitive exercises based on recommendation of association on the field	6	PROTOTYPE SYSTEM Tested in intended environment close to expe
l (AUTH)	0		blended with games such as the virtual walking in the world through the Google Street View. It <u>monitoring/assessing</u> the senior's physical/cognitive status accuracy is above 75% (http://fitforall.gr)	7	DEMONSTRATION SYSTE Operating in operational environment at pre-c
Mentor A ge®			MentorAge [®] is an Ambient Assisted Living product that uses 3D sensors to capture	8	FIRST OF A KIND COMMER All technical processes and systems to support in ready state
(NIVELY)	8	9	movement of elderly people and detect conditions of real or possible danger, reacting through the home automation system and sending out alerts when needed.	9	FULL COMMERCIAL APPL Technology on 'general availability' for all con
UniversAAL			Open platforms which will make it technically feasible and economically viable to		





Related Projects





Project methodology



The plan of the implementation

Brief description of the Work Packages (Section 3 Implementation) in an abstract way



Pilot sites (if any)

*AUTH Thess-AHALL living lab (T7.4): A living room environment and a kitchen environment is set up in the same physical space. The Thess-AHALL, equipped with home appliances and furniture so as to better resemble a senior's home, is constantly visited by elderly people participating in pilots for European projects, projects of associate research groups and companies. Thess-AHALL is co-located and co-operates with a fully equipped neuroscience lab (equipped with EEG devices) (http://www.openlivinglabs.eu/livinglab/thessaloniki-active-and-healthy-ageing-living-lab-thess-ahall).

*AUTH Chariseio (nursing home) (T7.4): AUTH supports the Chariseio Living Lab located in a nursing home with more than 50 seniors. A special room equipped with state-of-the-art technologies (Kinect, smartTV, tablet, etc.) has already been installed. 15 seniors are planned to participate in the pilots. (www.aha-livinglabs.com)

*AUTH seniors' homes (T7.5): AUTH supports 5 older adults' homes equipped with hardware and software requirements defined by the prototype living lab of VILL-AGE. The seniors are encouraged to follow a minimum optional daily tasks and interactions with some devices (activity tracker, etc.) (www.aha-livinglabs.com)

***INTRAS's Living Lab Ecosystem (T7.4):** The Core Operational Center hosts 2 InnoHubs (eHEALTH; Eco-Innovation in Independent Living), 5 labs (Virtual/Augmented Reality, e-Health, Usability, Snoezelen, Data Managing Lab), equipped with software and devices for training, rehabilitation, monitoring, daily living assistance and communication technologies. A new INTRAS AHA pole is being prepared for offering complementary open innovation co-creation services, and a smart living showcase. It is already in place 2 convertible living spaces for testing and co-creation, including kitchen and living room (<u>http://www.openlivinglabs.eu/livinglab/iberian-institute-psycho-sciences-lab-research-and-innovation-centre-ibip-lab</u>).



Sex and gender issues

- The Consortium fully supports European efforts to improve gender balance in scientific research and development.
- Of the partner institutions, nearly 50% of the liaisons are female.
- In addition, all scientific teams include a high proportion of female scientists as can be seen from the partner profiles.
- The Consortium will strongly encourage women to participate at the project implementation wherever possible in order to transfer knowledge from the experienced
- In order to increase the number of female researchers in CAPTAIN all advertisements for new positions will indicate that women are actively encouraged to apply.
- The consortium believes that gender equality is best promoted by having both women and men working together in equal positions with equal salaries and by attracting the best qualified people.



1.4 Ambition

density

- Identify the main advances that your proposal brings
- Describe the current state of the art (scientific publications or even commercial innovations)
- Describe, convincingly, how your project will develop beyond the Indoor location and gait analysis 1.4.3 state-of-the-art SoA: Gait pattern analysis in older adults can be used as early predictors for cognitive decline (Gillain et al., 2009).

functional limitation and even mortality (Studenski et al., 2011). Additionally movement properties such as walking speed has been utilized as a means of predicting adverse events among older adults, such as falls (Montero-Odasso et al., 2005)(van Schooten et al., 2015). Recently research has been done in indoor location classification techniques, intelligent monitoring approaches, and moving object tracking in real-life contexts (Appiah, Hunter, Lotfi, Waltham, & Dickinson, 2014). Additionally machine learning methods have been utilized to estimate indoor location and movement speed (Zhou et al., 2008), while time-series analysis has been used to identify abnormalities in continuous assessment of video trajectories (Jung, Jacques, Soldera, & Musse, 2006). Using clustering algorithms which automatically recognize low and high density regions (Ordonez, Omiecinski, Navathe, & Ezquerra, 1999), it might provide more detailed information about behavioural patterns relating to activities of daily living and habit variation. However, most of the current research works focus on average features extraction and analysis and not clustering and analysing each indoor movement separately.

Beyond SoA: CAPTAIN builds upon the previous AUTH's and Nively's work on indoor analytics in the wild (Evdokimos I. Konstantinidis et al., 2016)(E. I. Konstantinidis. Billis, Plotegher, Conti, & Bamidis, 2016) where 0 based clustering was applied on indoor (location) transitions (Evdokimos I. Konstantinidis & Bamidis, 2015)(E. I. Konstantinidis et al., 2016) in real seniors' homes for about a

Implementation

When to think the WPs

- As soon as a first draft of the narrative Excellence Section is written, try to create a list of WPs.
- Add tasks that reply to the objectives.
- As soon as a first list of the WPs and Tasks has been drafted, revise the draft version of the Excellence Section.
- This will ensure consistency
- Do not introduce new concepts in either of the Sections 1 and 3 unless you are ready to revise both sections again.



The Boss of writing

- Not because s/he is good
- Not because s/he is smart
- Not because s/he has experience
- But because
- S/HE HAS A CONSISTENT THINKING



Work plan – Work packages, Deliverables and Milestones

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36



1 Management																								
1.1 Project coordination and consortium management		•														•								
1.2 Operational management and quality/risk control																		4						Щ
1.3 Financial management and reporting																								
1.4 Ethical and Security Management																								
1.5 Data Management												•								•				
1.6 Innovation Management																•								
2 Requirements Elicitation and Technical Specifications																								
Active stakeholders' network engaged throughout participatory 2.1 design phases																								
2.2 Agile Requirements Elicitation through user involvement					•																	_		
2.3 Software and hardware design						•										•			T			_		
2.4 Analysis of pilot-related regulatory requirements				Т							•									\square				
Data protection/privacy, liability and consumer protection																								
2.5 requirements																								
CAPTAIN appliance hardware prototyping and low level 3 software infrastructure development																								
3.1 Hardware Prototyping															•									
Optimisation of low-level data acquisition pipeline / test data																								
3.2 preparation / stand-alone testing																								
3.3 Data broker extension testing										•														
4 Non-invasive user and environment sensing				Т																\square				
4.1 Human presence recognition algorithm																								
Emotional, behavioural and contextual activity recognition																								
4.2 algorithm																								
4.3 Indoor location and gait analysis algorithm				T												•								
Physical and Cognitive training/intervention progress monitoring																							T	
4.4 through serious games metrics analytics																								
4.5 Data Analytics and online learning																					L			
5 CAPTAIN Coach behaviour design and AI algorithms	I T	ſ			1	1	ΙT	Γ	Γ													Γ		



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Work Package

ark package number WP1 Lead beneficiary AUTH												
Work package fitle	Management AOTH											
Participant number	$\begin{array}{ c c c c c c c c c c c c c c c c c c c$											
Short name of participant			DCU		4 INI	J NIVELV	0 NVI					
зногт паше от рагнстрант	AUIII	TA	DCU		1111	NIVELI	19 91	511				
Person/months per participant:	14.5	3.5	5.5		4.5	2.5	0.5	7.5				
Start month	1			End	l month	36						
 Objectives: The goal of this WP, led by AUTH, are: To address project objectives, <u>To</u> establish and run decision-making structures and technical support to ensure goal setting, progress tracking, document management and effective information exchange. 												
Description of work												
Task 1.1 – Project coordination and consortium management (Leader: AUTH, Participants: -) [M1-M36] This task consists of financial, stakeholder and contractual management												
Dependencies with other WPs For its horizontal nature, this WP is related to Milestones. MS1 Description of the Milestone (M8)												
Deliverables (brief description and month of delivery) D1.1 – Project management and quality control plan [M2] (R, PU, AUTH) : This report will define all the project management framework along with all project quality control procedures, including a detailed description of project structure, partner responsibilities, quality control mechanisms, documentation control,												

documentation formats and exchange rules

D1.2 – First version of Ethics and Safety Manual [M6] (R, PU, AUTH): This report will define the first version of ethical and safety management issues

n_____

Task description example

Task 4.3 – Indoor location and gait analysis algorithm (Leader: PARTNER A, Participants: AUTH, PARTNER B) [M7-M28]

The goal of Task 4.3 is twofold:

- It will extend current technology by PARTNER A to detect the senior's indoor location.
- It will analyse the senior's indoor movement and balance.

This task builds on top of AUTH's and PARTNER A's work (Evdokimos I. Konstantinidis et al., 2016) where density based clustering was applied on The application of the High Density Regions (HDR) analysis will give indicators about the lower gait speed and whether this is attributed to cognition problems ... Besides this, the gait analysis will be enriched with information coming from the application of Statically Equivalent Serial Chain Modeling (González, Hayashibe, Bonnet, & Fraisse, 2014) which

Finally, this task considers compliance and contribution to the IndoorGML which is an Open Geospatial Consortium (OGC) standard for an open data model and XML schema for indoor spatial information ("Open Geospatial Consortium Official Web Page,").

D4.3 – Indoor location and gait analysis algorithm [M24] (R, CO, AUTH). This deliverable will report the methodology of the algorithm architecture and development in line with the evaluation results and the algorithms accuracy

- Do not be afraid to write things that make sense in real life
- CAPTAIN was written based on how to avoid mistakes from past proposals
- Discuss you implementation ideas with your colleagues and write the real implementation you would do if you invested you money on it.
- CAPTAIN introduced a completely agile approach where the end-users (participants) decide about the evolution of the project. This is far away from the waterfall approach, but it happens quite a lot in real life.



Lean Startup Framework





Project Review, July 10 2019



Not like this...





WP packages

- WP1 Management
- WP2 Requirements Elicitation and Technical Specifications
- WP3 CAPTAIN appliance hardware prototyping and low level software infrastructure development
- WP4 Non-invasive user and environment sensing

- WP5 CAPTAIN Coach behaviour design and AI algorithms
- WP6 CAPTAIN system integration
- WP7 Pilot Data Collection and Evaluation
- WP8 Assessment and Evaluation
- WP9 Dissemination, Awareness and Exploitation



Each WP has a leader

- Select carefully the leaders as they are the ones responsible for the work to be done
- They should be regularly discussing with the coordinator about developments, foreseen risks, impediments, etc.
- The coordinator is responsible to ensure that the work will done. The coordinator is not responsible for all the tasks.





List of WPs, Dels, Milestones

WP No	Work Package Title	Lead Part. No	Lead Pa Na	ır. Short me	Person- Months	Start Month	End month						
WP1	Management	1	AU	TH		1	36						
WP2	Requirements Elicitation and Technical Specifications	1	AU	TH		1	28						
WP3	CAPTAIN appliance hardware prototyping and <u>low level</u> software infrastructure development	5	PART	INE Del	liv. m) Deliv	erable nam	le		WP num.	Short name of lead part	Туре	Diss. level	Del. date
				D1.	.1 Proje	ct managem	ent and qua	ality control plan	1	AUTH	R	PU	M2
				D1.	.2 First	version of E	Ethics and S	afety Manual	1	AUTH	R	PU	M6
				D1.	.3 Proje	ct Periodic I	Report		1	AUTH	R	PU	M12, M24
				D1.	.4 Final	version of I	Ethics and S	Safety Manual	1	DCU	R	PU	M24
Mileston	ne Milestone name	Milestone name Related Est. Means of verification							1	DIG	R	PU	M6, M18. M30
number		work package(s)	aate						1	AUTH	R	PU	M36
MS1	Build the CAPTAIN Stakeholder's Network	WP2	M6 T	The men engaged in the projec design and	bers of t small scale t lifestyle agile deve	his networl e pilot trials enabling pa lopment	k will be throughout articipatory	_					
MS2	Hardware Prototype	WP3	M16 7	The first projection	t hardware system wit	e prototype h basec fund	e of the ctionality	_					
MS3	First system with basic functionality	WP6	M21 H	First integ with basic	gration of a functionali	ll the sub-c ty	omponents						
MS4	Non-invasive algorithms' integration	WP4	M28 7	The final and enviro	version of onment sens	the non-inv	vasive user rated						
MS5	Coach behaviour and guidance algorithm integration	WP5	M31 7	The final design and	version of AI algorit	the coach	behaviour						
MS6	Application for Patent	WP9	M35 H	Preparatio	n for applic	ation for a p	patent]					
MS7	Definition of business model and business take-up	WP9	M36 I	Launch o CAPTAIN	of a new N	company	based on						<- F

IMPACT!
2.1 Expected impact

SEARCH FUNDING & TENDERS Y HOW TO PARTICIPATE

PROJECTS & RESULTS WORK AS AN EXPERT SUPPORT

Oct 14, 2015

Personalised coaching for well-being and care of people as they age

ID: SC1-PM-15-2017

Expected Impact:

Topic Updates

Topic description

Conditions and documents

Submission service

Get support

Call information

Call Updates

The proposal should present methodologies and metrics as appropriate for measuring its progress towards the expected impact in:

• Usefulness and effectiveness of personalized recommendations and follow-up in terms of the goals of preserving physical, cognitive, mental and social well-being for as long as possible;

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in,

- Validation of non-obtrusive technology for physical, cognitive, social and mental well-being;
- Evidence of user-centred design and innovation, new intuitive ways of human-computer interaction, and user acceptance;
- Potential cost-effectiveness due to enhanced self-care, life-style and care management.

Cross-cutting Priorities:

Socio-economic science and humanities Gender Open Innovation

Expected impacts set out in the work programme

CAPTAIN brings significant contribution to the expected impact set by the call, as highlighted below

"Usefulness and effectiveness of personalized recommendations and follow-up in terms of the goals of preserving physical, cognitive, mental and social well-being for as long as possible"

CAPTAIN's continuous and unobtrusive sensing of physical, cognitive, and social functioning has significant potential to support lifelong health management by acting as an early warning system to detect changes in any aspect of well-being, delivering context-aware micro-interventions to elderly individuals when and where they need them and significantly accelerating these individuals as well as their social ecosystem in understanding not only their health condition but also how to manage it efficiently. CAPTAIN will use an innovative projective environment to provide useful and effective contextualised (i.e. directly projected onto the real world) assistance virtual coaching to the elderly living at home. To maximise its **effectiveness**, the coaching interface blends with the home environment where **personalised** aid, based on use of Artificial Intelligence, is used to stimulate and enhance the capabilities of the elderly. To do so CAPTAIN creates a "transparent" interface, which acts as a constant, vigilant, and pleasant companion in the house, ubiquitously present wherever and whenever needed, that provides contextualised advice to help preserving the elderly's **mental & physical** (promoting exercise in a playful manner), **cognitive** (constantly stimulating the elderly during daily activities), and **social** (facilitating access to social interactions) well-being. The transparent nature of the interface, based on projective and tangible interaction, causes no attention grabbing, which is instead typical of other technologies such as smartphones, smartwatch, wearable devises, etc.

[Addressed by O#1, O#2, O#3, O#5, O#8], KPIs (Table 1): KPI1.3, KPI1.4, KPI2.2, KPI3.1, KPI3.2, KPI4.1, KPI4.2, KPI8.2, KPI8.3

"Validation of non-obtrusive technology for physical, cognitive, social and mental well-being"

Obtrusiveness and intrusiveness are often considered in home-based health literature as criteria (i.e., non-obtrusive and non-intrusive) for home-based health technologies to be successfully implemented. The technology developed by CAPTAIN is truly unobtrusive and as non-intrusive as possible since it is presented only when and where it is



Additional societal impacts

- The philosophy behind participatory design is that everyone has something to offer to the design process
- CAPTAIN challenges traditional skepticism or fear about sensing behavioral data can be sensed



Potential barriers/obstacles and framework conditions to achieving the impacts of the call

- A further challenge will be to engage an adequate number of seniors as members of stakeholders network, who will ultimately be willing to have CAPTAIN installed in their homes for data acquisition and evaluation purposes.
- **Costs**: The ultimate adoption of CAPTAIN at the home (or nursing home) will be in part determined by cost.
- Technology Adoption: the intention to use technology will be formerly assessed through the initial pilot trials
- Adoption by health professionals: While this will not be addressed in the current proposal, we recognize this significant requirement.
- **Regulatory factors**: Ethical and legal factors play an important role in digital health systems. Securing the privacy rights of patients will be an integral and important aspect.





2.2 Measures to maximize impact

- Dissemination of project results
- Communication activities
- Management of knowledge and intellectual property (IP)





Dissemination of project results

- Objectives
- Target groups
- Directions
 - Awareness towards the general public and policy makers
 - Awareness towards the industrial community
 - Awareness towards the scientific community
 - Liaison with related projects
 - IPR (Intellectual Property Rights) and licensing agreement
 - New service delivery models
 - Market exploitation and business model
- Impact indicators (i.e. 1000 web page visits)
- Plan
- Exploitable assets



Dissemination of project results

- SWOT analysis
- Market dynamics
- Licensing considerations
- Business model
- Individual exploitation paths
- Joint plan





- Multidisciplinary experienced consortium Agile Methodology with Participatiney Design Stakeholders in all the stages of the project Radically frionwation in Digital Coaching using Tangitile Interfaces Transparent technology visible only when and when needed
- APL FIWARE and universAAL compatibility

Opportunities

- opportunities
- Extend CAPTAIN platform to other domains different from AHA (Smarthomen)
- Provides a platform for Big and Open Data
- Behavioral coaching in CAPTAIN can be enter to multiple health conditions.
- Opportunities to patent and licensing apr

Weaknesses

- Lack of published evidence on user-acceptance in related projects.
- Product production issues to be addressed after the orniect and
- Unobtrusiveness levels can not be full anticipated
- Micro-cameras raises concerns on tru
- System Implementation cost
 Technology adoption, updating and op
- Technology adoption, updating and cos influence

Analysis Threats

SWOT

- Rapid growing market (new competing solutions)
 Future EU directives (potentially altering regulations)
- Competitive products and services from large size companies
- Data Privacy exchange information among sites
 Regional privacy and ethic legislature based on the opunity participant



Communication activities

- project's corporate identity
- engaging all relevant stakeholders
- project's visual identity (logo) and slogan
- Website (www.CAPTAIN.eu),
- informational materials
- having press entries and newsletters
- social network campaigns, blogs and online sources.





Management of knowledge and intellectual property (IP)

- Results
- Ownership
- Use
- Protection
- Background
- Access rights
- Open Source Policy
- Data Management



II

Build the right consortium

- Once there is a clear idea of the tasks, you should be looking for partners that have the specific expertise.
- Either consortium partners can fill many gaps (small consortia) or for each group of similar tasks you look for partners to join the consortium (large consortia)



It is good to

- Have big companies (to ensure the work will be done)
- Have startups (to make sure that opportunities can be emerged)
- Have universities or research centers (for the core research)
- Captain has 4 startups, 2 of which had never submitted a proposal before



Clearly justify the role of each partner

- A partner without a clear role can destroy the consortium
- The evaluators have experience in writing. If you try to push a role to a partner, just because it is a friend partner, it will be perceived by the evaluators as a weak point



In your consortium there is ONLY room for good partners, not for friends



*don't worry about geographical distribution provided that elegibility criteria are met and each beneficiary has a VERY clear role





One of the pilot partners was invited

- 2 days before the submission deadline
- We had to find a role that
 - Wouldn't require changes to the whole document
 - Would justify clearly its role
- A real life pilot case during the last months of the project
- The partner would be involved during the design and implementation phase (almost zero contribution/changes to the WPs)
- Primary role on the evaluation WP where this partner would be a real test case scenario.



When you look for partners



- Look on internet
- Go through their web pages
- If you have more than one potential partners, interview them or add both (if their expertise is the core business of the proposal).
- !!! Ask them if they have participated in any H2020 before !!! If they haven't it is a risk if they do not understand how such projects work.
 - For instance one of the startups focused more on their product rather than on the project's needs
 - Another startup, thought that at the end a product should be ready, and thus they were investing time on proper product development rather on the design and development of a prototype.

If you want to be attractive by other consortia

- Find and define your expertise
- Be as specific as possible on what are you main competences.
- Focus on a niche area, as partners 4all are not attractive at all.
- Spend time on creating a nice and simple web page (photos, etc.)
- Try to avoid joining consortia where you cannot highlight your expertise as the partners will remember that you have no expertise or specific domain.
- One of the core partners on projective augmented reality was invited 1 week before the submission deadline



The challenge is to be re-invited

- Based on your responsiveness during writing the proposal
- Based on your responsiveness, professionalism and honestly during running the project
- Based on your flexibility to go some times beyond the agreed effort, just for the sake of the project or to fill any gaps that were left open during writing the proposal



Unpleasant example



• Budget shifted from one partner to another during writing the proposal because of the contribution provided





Risks and mitigation

Ris	k											
Description	Probab ility	Impa ct	WPs Proposed risk-mitigation measures									
Analysis risks												
Agile approaches not well adopted	LO	HI	2	5 partners of the CAPTAIN's consortium are strongly involved in living lab activities and co-creation methodologies as part of their living labs' daily tasks. Co-creation methodologies are built around the participatory design and thus, these partners will introduce and harmonize the agile approaches throughout the consortium.								
Technical risks												
Technical support required for bug-fixes during the Pilots	MED	HI	3, 4, 5, 6	CAPTAIN devotes a whole WP (WP6) on the final integration of the system. All the technical partners are involved in this WP and therefore, any arising technical issue will be solved event during the pilots. Besides this, <u>The</u> development of the CAPTAIN will be accompanied by pilots trials where new releases will be tested as soon as they emerge.								
Operational risks												
Insufficient number of involved elderly citizens	MED	HI	4	Participatory Design (PD) implies active involvement and collaboration of the intended users, which is seen as one of the most significant requirements of good design. CAPTAIN builds a network of active stakeholders (T2.1) (relying on the participants who already trust the partners' living labs) which will support the participatory design through continuous <u>small scale</u> data collection pilots (T7.4, T7.5) during the requirements elicitation, design and development processes. CAPTAIN consortium will <u>investigated</u> the possibility on engaging some of the network stakeholders to the real seniors' home pilot trials								

Consortium as a whole

- Consortium overview and role of the participants
- Roles in the innovation process
- Past and current collaborations



Resources to be committed



Ι



				WP1	WP2	WP3	WP4	WP5	WP6	WP7	WP8	WP9	Total Person/Months
			1/AUTH	14.50	13.00	2.00	17.00	9.00	4.00	18.00	13.00	6.00	96.5
			2/ DIG	3.50	9.00	0.00	6.00	0.00	11.00	3.00	1.50	3.00	37
			3/ DCU	5.50	7.00	1.00	2.00	8.00	0.00	5.00	6.00	2.00	36.5
			4/ INI	4.50	1.00	0.00	0.00	0.00	0.00	1.00	9.00	23.00	38.5
			5/ NIVELY	4.50	8.00	16.00	14.00	5.00	3.00	11.68	4.00	3.00	69.18
			6/ NVISO	0.50	2.00	2.00	8.50	3.50	2.00	0.00	0.00	2.00	20.5
			7/ SIT	7.50	8.00	0.00	6.00	3.00	0.00	18.00	20.00	9.00	71.5
			8/ VICOM	0.50	4.00	7.00	10.00	17.00	8.00	1.00	5.00	1.50	54
Table 3.4b: 'Other direct	cost' items	1			.00	2.00	3.00	15.00	0.00	4.00	6.00	3.00	38.5
4/INI	Cost (€)	Justification			.00	0.00	0.00	4.00	2.00	10.00	10.50	2.50	35.5
Travel	15,000	2 person for 10 project meeting, 2 fairs and	d 2 conferences to sh	low resul	ts .00	14.00	5.00	5.00	4.00	0.00	0.00	2.00	34
		of the project			.00	0.50	2.00	0.00	0.00	11.00	5.00	1.00	26
Equipment	0				.00	0.00	0.00	0.00	0.00	3.00	1.00	1.00	7
Other goods and services	14,000	Dissemination material, printouts, part	icipation in works	shops ar	nd .00	0.00	0.00	0.00	0.00	12.00	2.00	2.00	24.5
		exhibition with booths											
Total	29,000				76	44.5	73.5	69.5	34	97.68	83	61	581.5



Keep reminding (show that you have a plan on) who (Partner), does what, based on which background/knowledge, within which tasks, meeting which objective, based on which component, described in which deliverable.



All text should be answering the objectives All the components must appear in all the sections (without increasing/decreasing their number)







- Development of engaging forms of physical and cognitive training (by AUTH).
- ... by delivering an interaction experience that is comfortable, effective and intuitive (O#4).
- ... personalized motivational guidance (O#3) embodied through a virtual coach persona (O#4) (developed by partners SAL and VICO) specifically designed to reduce risk and improve nutrition habits ...
- ..., particular attention will be paid to ethical aspects (under guidance of PARTNER A) as well as to implications in terms of information security, privacy (under guidance of PARTNER B) as explained in great detail in section 5
- Early enough in the project (T2.1) CAPTAIN builds a network of loyal stakeholders and user coming from the partner's living lab networks (AUTH, PARTNER A, PARTNER B, PARTNER C)
- ... which will support the participatory design through continuous small scale data collection pilots (T7.4, T7.5)
- ... The findings will form a formula which will be integrated in the webFitForAll's adaptation algorithm and guidance engine (T5.2). AUTH has already work towards this direction before where the in-game metrics analysis exhibited
- This task will collect data streams from algorithms developed in T4.1 4.4
- Plan a "roll-out agenda" (in line with the requirements of T7.3 and T7.4)





Section 1 - Excellence

- 1st page: The coach will also propose incentivising strategies based on serious games
- Macro objectives: Development of engaging forms of physical and cognitive training (by AUTH).
- **O#5**: To develop new approaches to increase engagement levels with physical and cognitive training.
- Scenario: There, the coach appears, dressed up in sportswear, encouraging John to take some physical exercise through the exergames that have been prescribed by his physiotherapist.
- Target Users and needs targeted: Playful engagement in physical and cognitive training.
- Relation to the work programme: Motivate a healthy and active lifestyle
- The solution: virtual coach persona
- **The solution (components description)**: The CAPTAIN's physical and cognitive training will be supported and promoted by AUTH's physical and cognitive serious games platform
- The positioning of the project: The webFitForAll is a serious gaming exergaming platform
- **Project methodology**: Within this WP, the physical and cognitive training guidance through serious games
- Ambition: Physical and cognitive training intervention guidance and progress monitoring through serious games metrics





Section 2 - Impact



- Expected impact set out in the work programme: provides contextualised advice to help preserving the elderly's mental & physical (promoting exercise in a playful manner)
- **Potential barriers/Technology adoption**: by delivering physical and cognitive training protocol based on serious games as part of a true healthcare program





Section 3 - Implementation

- WP4: Task 4.4 Physical and Cognitive training/intervention progress monitoring through serious games
- WP4: Deliverable D4.4 Physical and Cognitive serious in-game metrics analytics





Section 4 - Members of the Consortium

• **AUTH's profile**: Relevant publications Design, implementation and wide pilot deployment of FitForAll: an easy to use exergaming platform improving physical fitness and life quality of senior citizens





Section 5 – Ethics and Security

• Data collected through the AUTH serious games application will process the data according to the GDPR regulation.









Projections

Tangible interface Augmented reality

Localization Voice recognition





Localization





CAPTAIN

is able to detect your position inside the house and your posture (if you are sitting, standing or laying)

CAPTAIN Satellite Detector

- User monitoring without requiring the user to wear or hold any equipment (no smartwatches, no smartphones, no custom wearables)
- 3D depth camera for extracting the user's skeleton/silhouette
- One sensor per room (more can be added)
- Can support hand gestures



CAPTAIN Satellite Detector

- 3D tracking device relying on a depth camera (infrared technology)
- RGB Camera
- Filed of view: 60° horiz. x 49.5° vert
- processing unit running on Android
- Quad-core Cortex A17 Up to 1.8GHz (2GB DDR3)
- 2 microphones
- WIFI, Lan, Bluetooth







CAPTAIN Satellite Detector

- Tangible environment
- Detects and shares the user's absolute indoor position
- Shares the user's relative distance from the nearby POIs (e.g. fridge, table, etc.)
- Fires events when the user's hands collide with a virtual POI (e.g. fridge door handle)
- Fires events when the user's stands in a specific area (e.g. sofa area)
- Collects and analyzes the user's movements (e.g. gait analysis)
- Estimation of activities of daily living







Detect Indoor location

 Definition of 2D POIs (Position of Interest) inside the house – areas where the user moves



Project Review, July 10 2019
Tangible interface





https://www.youtube.com/watch?v=TRHqxQK3CX8

CAPTAIN

detects your hand movements and react accordingly

Detect Indoor location

 Definition of tangible 3D POIs (Position of Interest) inside the house – virtual cubes





Project Review, July 10 2019

Emotion recognition





CAPTAIN

can recognize basic emotions based on your facial expressions

Emotional, behavioural and contextual activity recognition algorithm



Project Review, July 10 2019

Projection generation

CAPTAIN

can project information in any surface of your house, whenever and wherever you want



 ~ 1

CAPTAIN Box

- Interactive experience without requiring the user to wear or hold anything
- Projects the content directly in the user's environment.
- The user sees the content in 3D from all angles with the correct perspective
- Simple hand gestures used for the interaction



CAPTAIN Box

- Short distance interaction with the user
- Can initiate the interaction with the user
- A head tracking system to create the optical 3D illusions
- The absolute position of the portable device can be inferred (inviting the user to interact with when it is close to)
- Generic 3D for video, audio/music, text, images/photos and web pages



CAPTAIN Box



Project Review, July 10 2019

CAPTAIN Satellite Projector

- Interactive experience without requiring the user to wear or hold any equipment (no glasses, no helmets)
- Pico-projector engine to project the content directly in the user's environment.
- Selected surfaces of the home (walls, ceiling, fridge door, etc.) can be turned into projectable interfaces for the user's guidance.
- More than one per room



CAPTAIN Satellite Projector

- Long distance interaction with the user
- Can initiate the interaction with the user
- Each projector's position is register relatively to the CAPTAIN Satellite Detector's position
- It is related to Projectable POIs
- Generic app for video, audio/music, text, images/photos and web pages



CAPTAIN Satellite Projector



Voice generation Voice recognition

CAPTAIN

can talk to you (provide information using voice) can hear what you are saying and act accordingly



TTS & STT -> Natural Language Processing

- Google TTS and STT used for the prototype
- GDPR restrictions lead us to offline solutions
- Mozilla Common Voice



SMART objectives coaching

- Person selecting and configuring a smart objective, configuring the:
 - Level to reach
 - Period of the SMART goal
 - Desired intensity of the goal



Hi! My name is Jack and I'm the ship's cook. I can help you to achieve these goals. Choose the one you would like to achieve







Say/touch the number to select. Say or touch back to return to the previous screen.



Our goal is to move from the technology innovation to social innovation

The CAPTAIN Community

101

-)

5 3

Co-creation session in CAPTAIN











Collaboration & Research Community for Independent Living





SISCODE

People 60+ become lifelong researchers and authors....



Responsible research and innovation

https://siscodeproject.eu/





"Participate 4..." Community Card











"Participate 4..."





Early stage researchers ...

... over 60

Create close ties with the *international* research community in your domain

Don't be pulled by the project. Pull it, or it will drag you away from your business



EC projects must fit with your RTD roadmap.

Don't build your RTD roadmap on EC projects



SOUNDS LIKE A

GREAT IDEA

DO start from the call and end up with a (great) idea.

DON'T start from your (great) idea try to make it fit with the call.

Don't underestimate what is written in the DoA: it could be your contract!!

CONTRACT

Limit deliverables and schedule them appropriately

(try to avoid many deliverables at the same deadine, you have limited resources)



Reality check: It is VERY VERY VERY VERY VERY VERY difficult and competitive





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