PRIME-VR2 - H2020 Project
Personalised recovery through a multi-user environment

December 2020 - Issue #04

NEWSLETTER

VR for Rehabilitation

PRIME-VR2 After Year 1

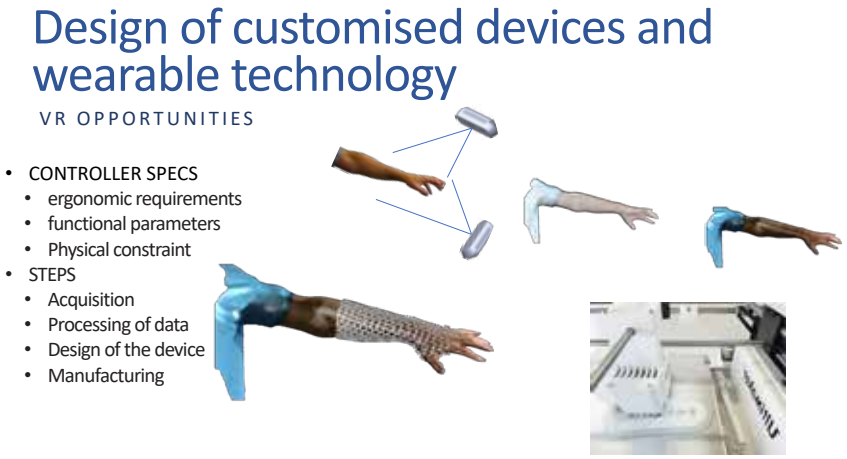
After one year, the project has already achieved remarkable results. We have designed and developed a User Data Toolkit for the assessment of patients, which is typically performed manually and with analogical tools, before starting a rehabilitation therapy and also in between. The toolkit consists of a digital capture system for shape and force assessment that is now being tested by the Living Labs with real patients. The collected users' data are used by the User Profile Toolkit, which generates a biomechanical profile and a set of ergonomic requirements for each user.

PRIME-VR2 at VR Days - XR talks

Four members of the PRIME-VR2 project were invited to deliver a talk at the international conference VR days held online in November 2020.

Armando Razionale - University of Pisa

"VR for users' upper limb profiling creates many opportunities for novel applications"



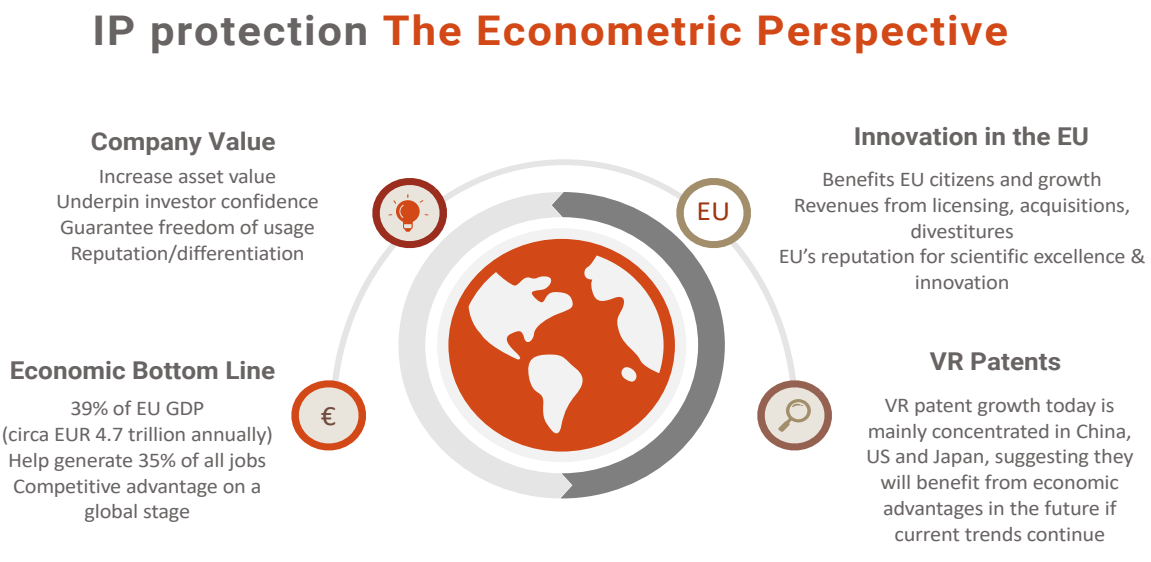
VR technologies for motion detection, shape acquisition and force assessment can be effectively used to profile users' upper limbs. The acquired data can be used in many ways: to design customized interaction devices and wearable technologies, to assess disabilities, to create avatars in VR applications. The design of customised devices or wearable technology is, nowadays, a fundamental task in the medical field.

The typical pipeline used for this purpose is based on the acquisition of the data, that could be tailored on specific device; the processing of the acquired data in order to obtain a usable model; the computer aided design of the device; and the manufacturing of the device, that could be carried on by using additive manufacturing technologies.

Jenny Rainbird - Inlecom

"Protecting your IP and Commercially Sensitive/Strategic Innovation"

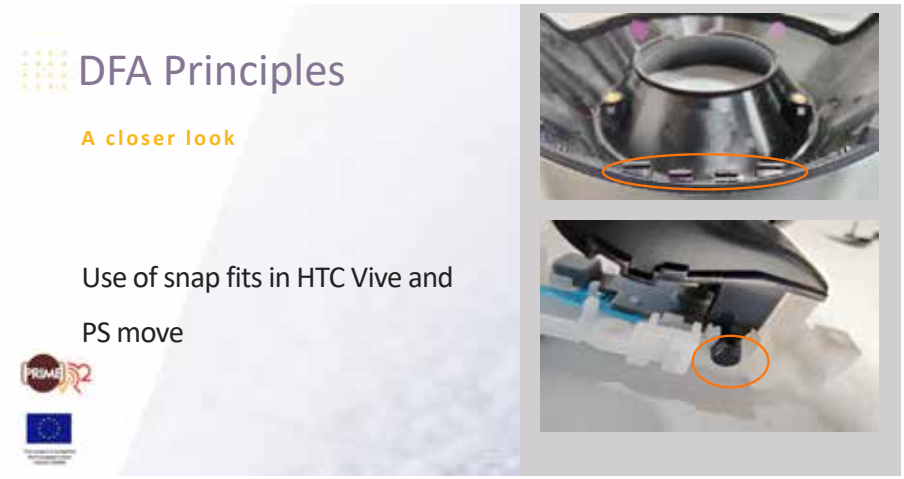
The VR Days presentation was given by Jenny Rainbird a Senior Project Manager at Inlecom. Inlecom supports collaborative R&D and paths to commercialisation with leading industrial, academic and SME partners across Europe. Inlecom has seen over 350 successfully granted patents and been integral in supporting a number of successful spinouts over the years. The presentation described the importance of IP protection and how this can help underpin investment confidence to Venture Capital and Angel Investors, as well as reputational and competitive advantages and provide a valuable asset on an organisation's balance that can be monetised. The presentation focused on the VR and AR market and demonstrated how these markets are predicted to be multi-billion market sectors with continuous growth expected over the next 10 years particularly in markets such as Video Games and Healthcare.



PRIME-VR2 at VR Days - XR talks

Here you can watch the videos of the talks.

Philip Farrugia - University of Malta
"DFA: Lessons learnt from VR Controllers"



It is well known that the early stage of the design process, in particular the conceptual design stage, has a considerable influence on the subsequent design stages. It is estimated that at the early stages of design, although the actual costs amount to ca. 20% of the total project cost, the committed costs amount to ca. 80%. Therefore, engineering designers must ensure that they develop a good concept of a product as early as possible. To accomplish this, there are a number of engineering design tools, one of which is precisely Design for Assembly (DFA). The underlying philosophy is that the engineering designer must take into account the consequences of his/her early design commitments on the subsequent stages of product development. Such an approach helps to improve the product performance metrics such as time, cost and quality. This presentation provides key takeaways from a detailed DFA exercise carried out by the University of Malta (UM) research team on three commercial VR controllers as part of the PRIME-VR2 WP4 tasks. The key findings will be used by the UM team to improve the evolving design of the bespoke controllers from an assembly point of view.

Anthony Demanuele - Flying Squirrel Games

Anthony Demanuele, studio head at Flying Squirrel Games gave a presentation during the exclusive VR Days about the status of Virtual Reality games in the rehabilitation space, the future of Tele-Rehabilitation using Virtual Reality, and the impact and opportunities of Covid-19 using real-life data from the EU funded Prime-VR2 project. The VR Days talk, which is now available for free access on the VR Days platform, kicked off with a brief introduction to identify the stake holders in this space and an exercise to identify the patients who can make use of this. To our surprise, there more patients than we originally thought ranging from athletes after a sports injury, to patients after stroke.

The presentation focused on how the use of Virtual Reality can help rehabilitation patients get better faster by giving them access to start therapy sooner, making it as intensive as possible and prolonged during the recovery phase at home. We concluded by outlining the progress to-date and the tasks that we need to work on to get all these benefits to the patients. The team at Flying Squirrel Games, as part of the Prime-VR2 consortium is doing just that so make sure to follow the project to learn more about this over the coming months.

Another milestone within the PRIME-VR2 project consists of the two-stage development of the User-Profile ToolKit (UPTK), which includes a dashboard that shows the biomechanical profile of the patients. The dashboard integrates the upper body shape, range of motion or movement and the forces exerted by the user's fingers. As observed in the clinical practice, and as a consequence of the requirements needed to develop bespoke controllers, the collected data from the patients need to be visualised so that all actors are included in the design process. In this case the actors are the clinician, the patient and the designer of the PRIME-VR2 controller. By mapping the actors and what data/information will be needed, one is able to prioritize the different requirements of the toolkit. The main user of the UPTK are the clinicians because it will allow them to diagnose better the limitations and abilities of their patients through the biomechanical profile. With the tool, the clinician will be able to suggest a particular controller with the essential hand modules required for the rehabilitation. Furthermore, with a therapy programme builder, the clinician will be able to create a tailor-made therapy programme for the specific needs of the patient. The toolkit was evaluated with different clinicians inside and outside the PRIME-VR2 project.

The Graphical User Interface (GUI) of the toolkit generally resulted to be very user-friendly. As a matter of fact, 55% of all evaluators rated the level of user-friendliness at 5 out of 5, whilst 27% rated 4 out of 5. The majority of clinicians (64%) remarked that ergonomic requirements are always crucial to take into consideration when designing rehabilitation devices, with an importance rating of 5 out of 5.

Evaluation of the PRIME-VR2 User Profile Toolkit

Additionally, 55% of all evaluators regard the usability of such a toolkit during the design process of rehabilitation products as highly important. Clinicians were also asked to comment on factors pertaining to the user experience of the patients involved in data collection through the toolkit. As a general comment, clinicians remarked that for some patients, the entire experience would be enhanced as it results in a more fun and engaging performance. For others using this technology might instil fear as patients prefer more traditional methods of prescribing exercises. The effectiveness of the supplied controller was the main driving force behind the motive in recommending this tool to other clinicians. Furthermore, this computer tool improves their ability to address the patient's functions through rehabilitation. The toolkit gives the clinicians the ability to control and improve the quality and outcomes of the exercises for the first time, where the client can also be involved. In particular, one clinician remarked that:

"Involving the client in decision-making about the controller design, including colour, visual style and functional features could be very attractive."

The UPTK will be also helpful for the subsequent design activities related to the controller. When integrated within a VR environment, the toolkit would support the clinicians in identifying the best controller for their clients. The UPTK can therefore enhance the patient-therapist interaction as it increases the clinician's ability to address the client's needs in particular with exercises performed at home.

Creating next-gen pro athletes using Virtual Reality

The popular 1999 sci-fi motion picture The Matrix depicts a dystopian future where humans are unknowingly enslaved in a simulated reality by an unknown alien race. This simulated reality is so 'real' that no one saves the protagonist and a handful others were able to overcome it. Fortunately for us, not even the year 2020 posed enough of a threat to enslave the human race to that extent.

While the thought of living inside a simulated reality might have seemed far fetched 20 years ago, we are now closer than ever to achieving this goal thanks to the strides in Virtual Reality technologies we have seen, especially in the consumer sphere. Rather than totally mimicking the whole reality as we know it, VR excels at simulating individual facets of life with applications in fields such as Education, Gaming, Military, Health and of course Sports.

Throughout history one can observe a simple yet common repeated pattern across all sports disciplines: they all undergo changes and evolve to become the sports we are familiar with today. As new technologies are introduced, these in turn are adopted by new breeds of players which in turn lead to new techniques of play being introduced thus evolving the sport. Tennis is one such sport that has had its style of play changed drastically in the last half century. In the early 1980s we saw the shift from wood to graphite-made racquet, which were not only stronger but also lighter, leading to harder-hitting larger racquets. This change in turn brought a new wave of professional players with a new range of techniques to compliment this change.

VR is still a new technology and if history is any indication then it has the potential to change how the game is played, literally. Athletes embracing VR are no longer limited to fixed sports facilities but instead they can practice in the comfort of their homes. Standing and playing next to a fellow athlete that is thousands of miles away may also become an attractive proposition for athletes with logistical difficulties. VR technology also works hand in hand with established computer science fields such as that of Artificial Intelligence: exercise and practice alone with the use of AI, which does not tire and adaptively learns from your play style and captured analytical data.

The team at Flying Squirrel games, as part of the PRIME-VR2 consortium is working on something noble - helping patients rehabilitate faster and better using custom controllers while playing games in Virtual Reality. The lessons learnt here are set to be useful in training the next-gen athletes of the future.

MEET THE TEAM: CAPITOLA

Capitola Digital BV is a digital innovation-driven organisation. This means we always work with the most advanced technology and rely fairly heavily on R&D and prototyping in our products and services. We work with a team of some 25 driven colleagues in the field of development, creation, communication, strategy, and project management on projects for both governmental, semi-governmental, non-profit, and commercial organisations. The focus of our productions is particularly on interactive installations, Virtual Reality, and Augmented Reality, but this merely relates to productions. Our services aim to translate (complex) issues/topics to ready-to-use, simple communicative visual solutions. This results in the relatively unique way in which we work: we not only have the strength to create innovative products, but can also handle the translation from VC issues or messages to solutions and experiences. Capitola was founded by merging an advertising agency and a digital agency into an organisation that can handle both the strategy, concept and marketing side, and also design (2D and 3D), animate, and develop what is conceived.

Capitola is responsible for the software side of the VR platform and content. We are working on strategy, concept outroll design and development of the tool. The development is split up in front end and back end development. All the development work will be tested and bug-fixed in order to launch a flawless and successful app. The framework will need to be built and the different elements will be implemented and developed in order to create a suitable and solid VR tool. These include the different gamification elements, infrastructure and components. Capitola will make sure the software communicates with the hardware and that the different chosen results are stored properly. All gameplay will be built in the game engine Unity. We will use a rapid prototype method in order for the development process to be as smooth as possible. Project Management will be organised in order to communicate during the process among the different key stakeholders and the internal development team.

Yvonne Smits

Yvonne Smits is working as a Digital Project Manager at Capitola. She will be responsible for the content throughout the PRIME-VR2 project on behalf of Capitola, and to supervise its consistent implementation according to the specifications.

Robert Mooijman

Robert Mooijman is Capitola's lead developer and will bear final responsibility for digital aspects in the project team for the healthcare projects. He has a lot of experience in realizing interactive (VR) productions, visual setups, and animations.

MEET THE TEAM: CROWDHELIX

Crowdhelix is a pan-European Open Innovation Network that connects and enables research organisations, SMEs and industry to collaborate, innovate and grow. The Network has more than 450+ member organisations from 45 countries and is present in all EU Member State countries. The Network is set-up around thematic areas called “Helixes” (e.g. Health Helix, Societies Helix, Digital Helix etc.), and is supported by a custom-built open innovation platform, where these virtual communities are hosted.

A Helix is a specialised community/cluster comprising experts and research & innovation professionals across academia and industry. The Crowdhelix platform consists of multiple thematic helixes, whose reach extends to 400,000+ research and innovation actors (across its members), and directly to 4,800+ users currently on the Crowdhelix platform.

Our role in the project is to build a strong, self-sustaining community of like-minded stakeholders that will have access to updates on the project and collaborate with experts in their field of interest. The Virtual Reality Helix will include end-users, exploiters, participants of previously funded H2020 projects and other relevant industrial actors. This variety of stakeholders will cover all the project’s aspects, and will therefore guarantee continued interest from key actors, during and after the project.

The Crowdhelix Network is open to applications from any organisation, of any size, anywhere in the world, that can demonstrate a strategic commitment to collaborative research and innovation.

Marine Desoche

Marine Desoche is a Project Lead at Crowdhelix responsible for Horizon 2020 project & portfolio management, Helix community management, and project stakeholder engagement.

Michael Browne

Michael Browne is Director of Crowdhelix Ireland, co-founder of the Crowdhelix Network, as well its policy and innovation partnership lead, positioning Crowdhelix within the European research and innovation landscape.

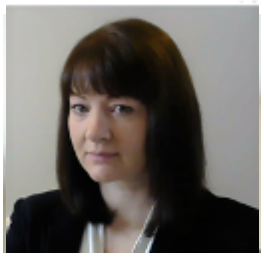
Andreea Petrea

Andreea Petrea is Communication & Events Manager for the Crowdhelix Network, responsible for supporting the network’s events programme, and communicating the network’s activities.

MEET THE TEAM: INLECOM

INLECOM is a European SME with offices and consultants in Brussels, Ireland, London, Spain and Greece and is an established leader in Digital Ecosystem Platforms and technologies in domains such as Transport & Logistics, ICT, Healthcare, Cognitive Computing, Social Software, Analytics, Big Data, Mobile Computing and Security. With an international team of experts in the areas of Mobility, Business Consulting, Commercialisation, EU PO and USPTO Patent Filings and Business Analytics, INLECOM provides strategic knowledge-centric solutions and consultancy to help private and public organisations use their unique capabilities to create or strengthen their competitive advantage.
In the PRIME-VR2 project, INELCOM are leading the Communication, Dissemination and Exploitation work package to ensure that the results of the project are communicated to those who are interested in innovation for the rehabilitation of patients from a stroke, sports injury or those who have hyperkinetic movement disorders and those who are interested new applications for Virtual Reality and novel and bespoke designs for VR controllers.

INLECOM are designing and are responsible for implementing the IP protection strategy for monitoring, managing and documenting activity regarding the IPR of the project's research outputs. INLECOM also leads and guides the commercial roadmap for the project and will deliver the business plan, feasibility, market analyses and market research as well as venture capital and investor landscape assessment to guide commercial and industry sustainability of the project.



Jenny Rainbird

Jenny Rainbird (MBA) is a Senior Research Project Manager with over 20 years' experience managing large, complex and multi-disciplinary EU research projects in the areas of safety, security, maritime operations and transport. Jenny is leading the Communication, Dissemination and Exploitation work package.

Patrick Durkin

Patrick Durkin is INLECOM's Commercial Director and has led a range of commercial enterprises over an extensive career in enterprise technology. He has helped researchers identify commercial applicability of their research and support them with practical market validation to secure initial funding for spinout ventures. Patrick is the PRIME-VR2 Commercial Manager.

Pat O'Sullivan

Dr. Pat O'Sullivan is the INLECOM Director of Innovation & ICT Solutions and has an interest in supporting commercial outputs from EU Commission Funded R&D projects across the SME sector. Pat has led countless commercialization projects and teams and has filed over 500 patents, many of which have been successfully commercialized. Pat is the PRIME-VR2 Innovation Manager.

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PRIME-VR2
Personalised recovery through a multi-user environement
VR for Rehabilitation

NEXT ISSUE: March '21

In the next issue, we will talk about achieving our next milestones: the demonstrator of the VR environment and the Basic working controller. We will report on the Tutorial Video's of the Training Building Programm and introduce two more of our partners.

NEXT EVENTS

The first month of 2021 will host the first Virtual Reality Helix event in the form of an online workshop. This event will bring together EU-funded projects focused on similar topics as PRIME-VR2 with the aim of finding ways of improving communication, both between the projects and with our public. Within this event attendees will also reflect on how they can work together to create a greater impact of their results as well as ensuring that the results won't overlap. The programme will focus on helping each other to grow and provide better results for our public.

CHECK THE WEBSITE REGULARLY FOR MORE NEWS, DOWNLOADABLE CONTENT AND INFORMATION!

ADDRESS

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powered by: Crowdhelix

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