VR|AR

INDUSTRY OF FINLAND

INDEX

INTRODUCTION

A NEW WAVE of virtual reality technology saw its launch early in 2016 with the release of HTC Vive and Oculus Rift. The technology that in the past had been incredibly expensive and meant only for professional use finally entered the public mass market, ready to take it by storm. The notion of virtual reality has spread in the public consciousness like wildfire, inciting hyped up futuristic visions of technologies that could decisively change our everyday lives. Most of these visions require a long time to materialize, some might never become true, and many have become reality already. Virtual reality (VR), augmented reality (AR) and mixed reality (MR) applications already create significant business benefits in industry sectors such as heavy industry, architecture, engineering & construction (AEC) and real estate, healthcare and education, and the potential of these immersive technologies for these and other sectors is growing. In the meantime, the consumer VR market is slowly maturing, slowly gaining momentum and anticipating lower entry price levels, while consumer AR applications for smartphones and tablets are ready to make a larger impact in the near future. The popularity of face modification filters in Snapchat and Facebook and the AR gaming phenomenon Pokemon Go have already shown a glimpse of the potential AR content possesses.

FINLAND, with its excellence in engineering and design, has been fertile ground for adopting and developing innovative technologies and creating business opportunities, which can be seen in the impressive amount of local XR (XR = VR, AR and MR) activities within the past few years. The Finnish XR scene is a tightly-knit developer community of tech

enthusiasts, which has drawn its power from hackathons, game development and visual computing expertise, high quality education and academic research. In recent years the Finnish XR scene has moved on from experimentation into establishing solid businesses. The developer community desires to share knowledge and best practices locally in order to reach a common goal: a healthy development ecosystem in Finland. A healthy development ecosystem is capable of providing complementary services and form partnerships with other players within the field in order to develop an early domestic market and compete globally. It thrives on fair competition, reducing early risks of startups through networks and community support and encourages companies to develop distinctive business profiles.

THIS is an overview of the Finnish XR ecosystem in 2017, with information of current business, research and education initiatives and network groups of the VR, AR and MR technology field. It serves as a database and contact point for all individuals interested in the opportunities that immersive technologies have to offer in Finland today. All research materials for this report were gathered during the summer of 2017 through a questionnaire and verbal interviews. A total of 60 companies out of 94 targets in FIVR's growing XR company database responded to our survey and in effect became a part of this report. We kindly thank all involved parties for their help and support in making this report, with special thanks going to Tekes as the enabler. We wish success and best of luck to every developer and VR/AR enthusiast in Finland!

Team FIVR:
Santeri Suominen, lead author
Tuukka Takala, co-author
Olli Sinerma, co-author

TERMINOLOGY OF VR, AR, MR AND XR

THE TERMINOLOGY of VR, AR and MR can be confusing. What are these R-things exactly? Those new to the field often find themselves unable to distinguish between VR, AR, MR and 360 video. This makes communication of ideas between developers and clients difficult. Umbrella terms, such as extended, or "X" reality (XR) or "immersive technologies", have great use in general discussion, as they provide cohesion and an easy alternativ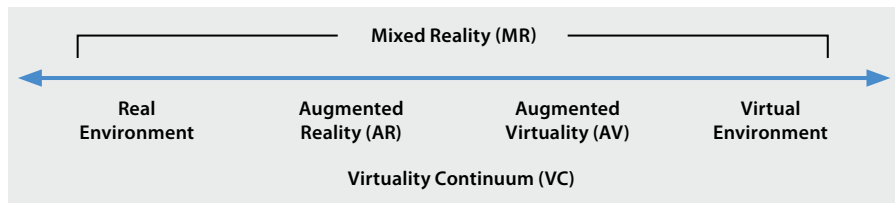e to always separately mentioning VR, AR and MR. However, terminology regarding immersive technologies still remains elusive for the public at large. Eventually, everyday use of XR devices and applications will create a language for itself. Many in the industry are using existing definitions borrowed from the scientific world: the most clear and widely adopted taxonomy is Paul Milgram and Fumio Kishino's reality-virtuality continuum, which has played a major part in defining many of VR's core concepts.

"WHAT ARE THESE R-THINGS EXACTLY? THOSE NEW TO THE FIELD OFTEN FIND THEMSELVES UNABLE TO DISTINGUISH BETWEEN VR, AR, MR AND 360 VIDEO"

THIS CONTINUUM has fully immersive virtual environments and real environments at its extremes. An application mixing real world elements and virtual elements together is an MR application. AR is a smaller subset of MR, with less virtual elements than real ones. On a conceptual level, the continuum is a great tool for understanding how interrelated VR, AR and MR are. In current practice, AR devices are generally regarded as head-worn, see-through displays, but the term can also include smartphone or tablet based AR. The terminology is partially muddled because the distinction between mixed reality and augmented reality has become a branding strategy between competing companies.

"ON A CONCEPTUAL LEVEL, THE CONTINUUM IS A GREAT TOOL FOR UNDERSTANDING HOW INTERRELATED VR, AR AND MR ARE."

Mixed Reality (MR)

Real Environment   Augmented Reality (AR)   Augmented Virtuality (AV)   Virtual Environment

Virtuality Continuum (VC)

COMPANY SIZES

AT THE MOMENT Finnish immersive technology companies are currently quite small on average, with 68% having a headcount of less than 10. These are mostly startups that have emerged in great numbers during recent years, quickly developing capabilities and capitalizing on new business opportunities. However, this group also contains seasoned companies that over the years have focused on R&D or indie game development instead of company growth.

15% of the companies are somewhere between 10 and 20 employees and an additional 10% have grown over 20 employees. These are companies with several years of business experience in 3D graphics and modeling, visual design, games, films or various tech endeavors, which has eased their adoption of XR technologies when compared to newcomers.
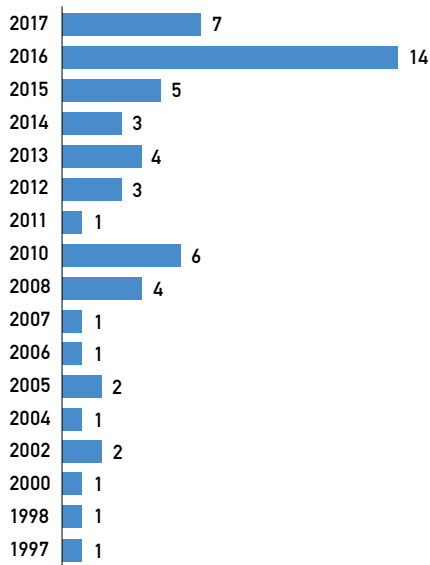
The remaining 7% are large digital service providers and consultation companies with over 50 or 100 employees, that are expanding into the field of immersive technologies. These big players are building their XR capabilities in order to prepare for future demand from customers.

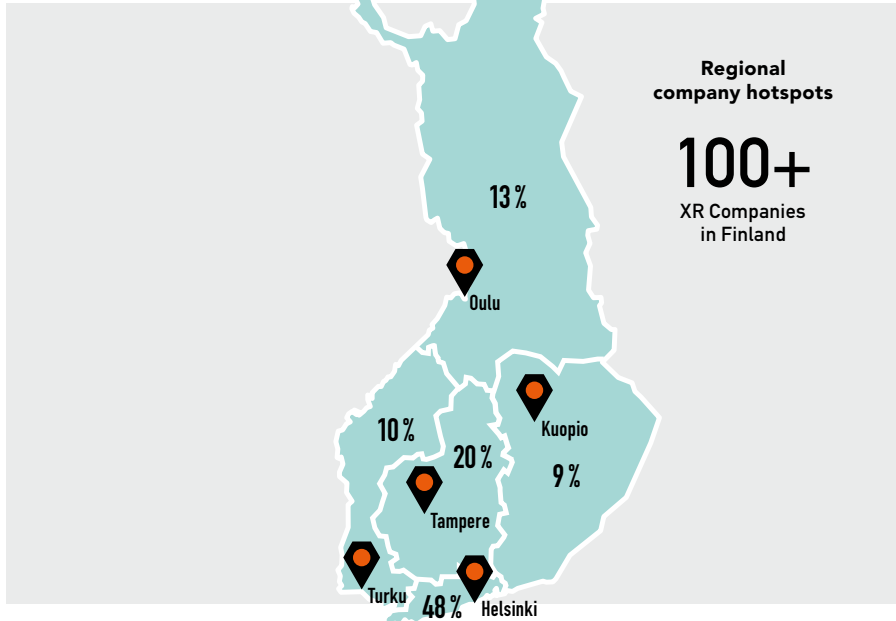**Number of employees in Finnish XR companies (2017)**

100+
7 %

20+
10 %

10+
15 %

60
companies
in our study

Under 10
68 %
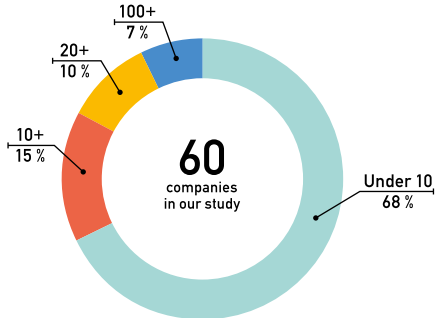
COMPANY FOUNDING YEARS

THE NUMBER of newly found XR companies has peaked in the recent years: 40% of the companies involved in this study were founded after the beginning of 2016, and 77% since 2010. Many of the newer startups are founded strictly for VR/AR development and services, as passionate early adopters and enthusiasts desire to experiment with new technology and explore its business potential. Various IT companies have pivoted towards XR business since 2015 with ever growing intensity and this number will likely grow in the future, as immersive technologies gain more foothold in different industry sectors.

Year	Count
2017	7
2016	14
2015	5
2014	3
2013	4
2012	3
2011	1
2010	6
2008	4
2007	1
2006	1
2005	2
2004	1
2002	2
2000	1
1998	1
1997	1

COMPANY LOCATIONS

Regional company hotspots

100+
XR Companies
in Finland

13 %

Oulu

Kuopio

10 %
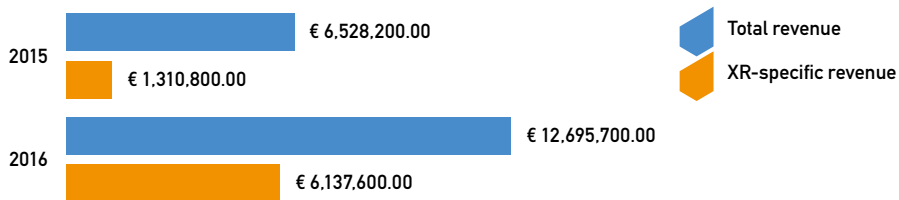
20 %

9 %

Tampere

Turku

48 %

Helsinki

REVENUE

THE NUMBERS shown here represent total combined and bracketed revenue of all companies participating in this study that were active during 2015 and/or 2016. They are not absolute, but accurate enough to give an idea of the revenue situation from the past two years. The ratio between overall revenue and revenue resulting from XR business ventures is still difficult to determine, as some companies were unable to give a fair estimate of revenue generated from XR business. Especially in the case of large companies that are transitioning towards XR business, the XR revenue can be just a small portion of the overall revenue. For this reason, some companies had to be omitted from the revenue chart altogether to help it reflect the current situation better.

Combined revenue of companies in the Finnish XR ecosystem

2015
€ 6,528,200.00
€ 1,310,800.00

2016
€ 12,695,700.00
€ 6,137,600.00

Total revenue

XR-specific revenue

BRACKETED REVENUE

THE FINNISH XR business sector is in its infancy, but significant growth can be expected in the near future, especially on the business to business application side. Between 2015 and 2016, the combined revenue of Finnish XR companies increased by 94% and combined XR-specific revenue increased by 368%.

Most companies that have started their operations in 2016 are still in the middle of their first full fiscal year in 2017. Some are expecting to generate revenue after their R&D endeavors start to bear fruit, which can be seen in the amount of companies having zero revenue. Some companies, on the other hand, have had a successful business since launch, growing their revenue above the 1 million threshold in a few years.

Client relations have begun to form during 2015 and 2016 and most eager early clients of VR/AR companies can be found in the AEC and heavy industry sectors, even if most use cases are currently restricted to marketing. Further major integration of XR technologies into design, personnel training or manufacturing processes is yet to happen at a large scale, although significant pilot projects are currently driving this progress. Many large companies, both clients and providers, are experimenting with new technologies and waiting for a favourable moment before fully committing into XR development and solutions.

On the consumer entertainment side, most self-funded or customer revenue funded game startups currently work on VR game projects with a minimal burn rate. Some generate additional revenue from other sources, such as non-VR games and B2B VR projects. In practice,

securing external funding is a must if a team wishes to focus entirely on VR game development. Established game companies are expected to have a lesser business focus on creating VR products, at least until the VR game market becomes more lucrative through a larger install base of devices.

Finnish XR company revenues in brackets

Year					
2015	12	7	7	1	3
2015 XR	15	7	4	1	
2016	16	9	13	5	5
2016 XR	17	13	11	2	2
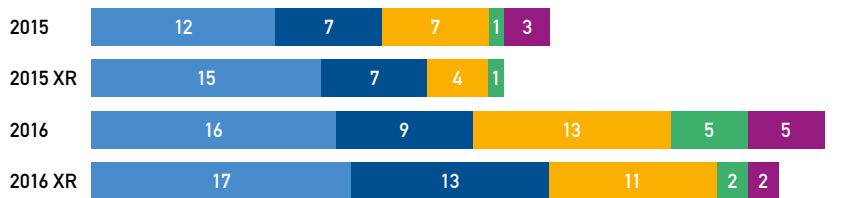
The differently colored column portions and numbers within them signify amount of companies in every respective revenue bracket. Below each year's revenue column is the same year's XR specific revenue column. The bracket ranges and their colors can be seen from the legend on the right.
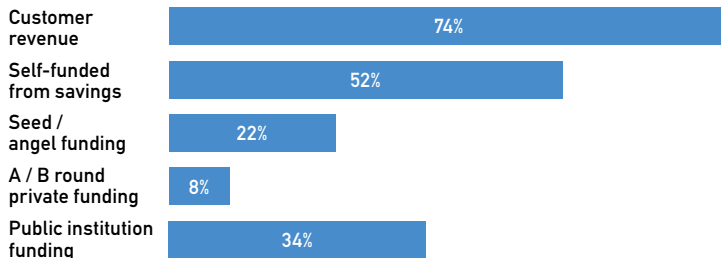
0
<100k€
100–500k€
500k–1m€
1m–5m€

FUNDING STAGE

TEKES, the Finnish Funding Agency for Innovation, is a significant enabler of XR initiatives with funding and support, and the new incubator program Nordic VR Startups has been met with excitement by many developers. Funding opportunities are currently in great demand, as XR companies are trying to get their business started and establish client relations.

Demand of VR and AR services is on the rise in the near future as use-cases accumulate, public awareness spreads and more companies wish to reap the benefits offered by these technologies. Providers need to match the increase in demand by scaling up their development resources.
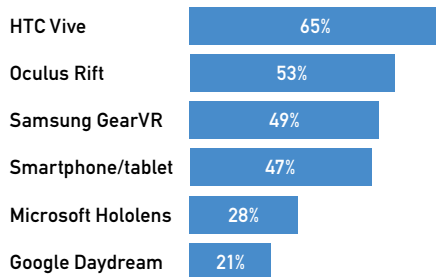
Funding situation of Finnish XR companies

Customer revenue	74%
Self-funded from savings	52%
Seed / angel funding	22%
A / B round private funding	8%
Public institution funding	34%

PLATFORMS

60 COMPANIES shared information of the platforms they use with a multiple choice questionnaire. AR developers mostly employ current smartphones and tablets for their services, anticipating a near-future increase in consumer use. Some companies have already taken a head start with the Microsoft Hololens, which is still expensive and has technological imperfections, but nevertheless shows the future promise of wearable mixed reality devices.

VR developers have found the high-end PC headsets Vive and Rift as the most efficient devices for their products and services. Even if the consumer install base of these devices is modest, the high-end headsets still see extensive B2B use. The largest install base of VR devices is found in the mobile side, where the Samsung GearVR stands out as the most used platform, followed by Google Daydream.

New devices are generally anticipated by developers, especially the ones that are situated between the mobile and high-end PC headset categories. It is possible that the launch of new standalone VR headsets and Windows Mixed Reality headsets will reshape the consumer VR landscape, and force price cuts on the more expensive devices.

Platforms used by Finnish XR companies

Platform	Percentage
HTC Vive	65%
Oculus Rift	53%
Samsung GearVR	49%
Smartphone/tablet	47%
Microsoft Hololens	28%
Google Daydream	21%

Other platforms include:
PSVR, OSVR, DAQRI smart glasses, ODG smart glasses, Web

COMPANIES IN THE XR ECOSYSTEM

- 360 Virtual Reality Global (2016)
- 3D Talo Finland (2016)
- 3rd Eye Studios (2016)
- ADE Oy (2000)
- Arilyn (2013)
- Ataverti (2008)
- Augmented Climbing Wall / Valo Motion Oy (2016)
- Avains (2016)
- Basemark (2015)
- BetterDay Innovation (2017)
- Brighterwave (2014)
- Catland Studios (2017)
- Citor3 (2016)
- Deeptale (2016)
- Delicode (2008)
- Delta Cygni Labs (2013)
- Dispelix Oy (2015)
- Eligo.Studio Oy (2016)
- Evacrity (2017)
- Event Horizon Designs (2002)
- Evocat Games (2017)
- eVocativi Oy (2010)
- Fake Production (2004)
- Finpeda (2008)
- Flatlight Creative House (2012)
- FlyAR (2015)
- Flycam (2010)
- Futuremark (1997)
- HipFire Games (2017)
- Iceflake Studios (2007)
- Immersal (2015)
- Kinoni (2010)
- Kutomo (2016)
- Leonidas Oy (2008)
- Lucky You Studio (2011)
- Lyfta (2016)
- Morrow Games (2013)
- Optofidelity Oy (2005)
- Peili Vision (2010)
- Pikseli (2016)
- Pixelface (2015)
- Player Entertainment (2014)
- Portaali (2017)
- Reality InFocus (2016)
- Refine Reality (2016)
- Siili Solutions (2005)
- Sky High VR (2014)
- Softability Group Oy (2002)
- Sovelto (1998)
- Stereoscape (2008)
- Teatime Research Ltd. (2016)
- There's No Spoon (2016)
- Thinglink (2010)
- Tridify (2012)
- Umbra (2006)
- Varjo Technologies (2016)
- Virtual Dawn (2012)
- Visumo (2017)
- Viversion (2016)
- Voyant Pictures (2016)
- VR Cinema / One Down Oy (2017)
- Zoan Oy (2010)

COMPANIES IN THE XR ECOSYSTEM

COMPANIES in the Finnish XR ecosystem are associated with a wide spectrum of activities and multiple industry sectors.

Individual companies are almost impossible to summarize with just one area of expertise, as diversity of the field offers many kinds of business opportunities for developers with well-rounded skill sets. Some wish to focus exclusively on a specific area of expertise, while others pursue multiple opportunities in order to develop versatility in preparation for future demand. Usually there are many things in simultaneous development for different platforms, clients and purposes.

A game studio, for example, may develop a VR game, a traditional computer game and B2B projects at the same time. B2B service providers do not necessarily discriminate between VR and AR applications, but actively research and develop both. Therefore most companies cannot be strictly classified as pure VR or AR developers.

"USUALLY THERE ARE MANY THINGS IN SIMULTANEOUS DEVELOPMENT FOR DIFFERENT PLATFORMS, CLIENTS AND PURPOSES."

Major market and industry sectors associated with the Finnish XR ecosystem:

- Adult entertainment
- Aerospace
- Architecture, engineering, construction (AEC) and real estate
- Automotive
- Games
- Education
- Healthcare
- Heavy industry
- Maritime
- Travel

Content and service functions:

- 360 photography and video
- Content management
- Design
- Developer tools
- Exercise
- Graphics
- Hardware development
- Maintenance
- Marketing
- Performance measurement (benchmarking)
- Training
- VR arcades

VR & AR business solutions are currently the mainstay of XR activities in Finland. The reasons behind companies entering the VR/AR field are roughly threefold:

1) Supply: Existing expertise in visual computing domains such as 3D animation, visualization, real time graphics, stereoscopic display technologies, computer vision, stereo camera capture systems etc. Experience in these domains has greatly helped in the transition to VR/AR development.

2) Demand: Client needs in industry sectors that already employ computer aided design methods. Such sectors include AEC, aerospace, automotive, heavy industry, and maritime industry for example. Immersive technologies have already spread into these sectors and their importance will continue to grow as integration between CAD and VR/AR methods deepens.

3) Passion, vision and timing: Developers believe greatly in VR and AR's potential to revolutionize design, healthcare, learning, marketing and training. The technology is mature enough to be borderline cost effective, but the potential, supported by strong early experiences and customer feedback, is very promising. Getting a head start now is the key for future success.

"DEVELOPERS BELIEVE GREATLY IN VR AND AR'S POTENTIAL TO REVOLUTIONIZE DESIGN, HEALTHCARE, LEARNING, MARKETING AND TRAINING."

360 Virtual Reality Global

360 VIRTUAL REALITY GLOBAL (2016) VANTAA

Licensing, production and distribution of 360 films.
- **Media consultation from decades of experience in video and broadcasting.**
- **Co-operation with VR Cinema Finland, the first VR cinema of the nordics.**

http://360vrg.fi/

360 Virtual Reality Global

3D TALO (2016) KUOPIO

- Software and services utilizing virtual reality, augmented reality and reality capture for construction, urban planning, industry, healthcare and marketing.
- Also offering photogrammetry and laser scanning services.
- Diverse expertise in software development, engineering and design.
- Member of VARPU, a VR development consortium funded by Tekes.

http://3dtalo.fi/

ADE OY (2000) TURKU

- Virtual reality software development for healthcare, construction and IT industries' use in marketing, training, design and equipment and operation room testing.
- Long background in creating 3D visualizations and training simulators.

https://ade.fi/

AVAINS (2016) HELSINKI

- Digital training content in virtual environments.
- Training content supports easily scalable browser and smartphone platforms in addition to immersive VR and AR environments.
- Founders' background in industry, game development and 3D modeling.

https://www.avains.com/

BetterDay

BETTERDAY INNOVATION OY (2017) HELSINKI

- VR rehabilitation for elderly care in nursing homes and hospitals.
- Recreating experiences of social interaction and nature in VR, which might otherwise be unaccessible to the user.
- Combines physical, mental and cognitive exercises in a safe and immersive environment
- BetterDay will launch their product in early 2018.

http://www.betterday.io/

DELICODE

DELICODE LTD (2008) HELSINKI

- Experts in computer vision and machine learning, with software licensed to over a 100 countries.
- Founders share a long history in developing Blender, the world's most popular open source 3D suite.
- Developing methods and workflow for doing volumetric (3D) video capture (a novel AR/VR content creation solution that, in terms of production overhead, lies between expensive 3D animation/motion capture and relatively cheap video).
- Finished (available on request) showcases created using the system include "Smoke" (a VR music video, supported by YLE) and "Nuanc3d" (a VR circus performance, supported by the Finnish Cultural Foundation) with more on the way.

http://www.delicode.com/

HEAVY INDUSTRY

DESIGN

TRAINING

ELIGO.STUDIO OY (2016) TAMPERE

- Augmented, Mixed and Virtual Reality (XR) studio:
- Helping industries improve their products
- Working methods and Training solutions
- Reach new customers with XR applications
- We have expertise in Content Development and IoT & AI integration for XR

www.eligo.studio

AEC   TRAVEL   **MARKETING**

EVENT HORIZON DESIGNS (2002) KANGASALA

- 3D-visualizations, -animation, -illustration and VR for marketing, architecture, construction and virtual traveling.
- Urquhart Castle, a historical castle ruins on the shores of Loch Ness, is being reconstructed in virtual reality by Event Horizon Designs.
- 14th century Urquhart Castle VR reconstruction is made in co-operation with Historic Environment Scotland.

http://www.eventhorizon.fi/

eVOCATIVI OY (2010) OULU

- **Formerly known as Valo Company, eVocativi Oy creates VR models and 3D visualizations for environmental and interior design.**
- **Specialty in collaborative design processes inside virtual reality.**
- **VR models: Oulu University Hospital 2015–, Järvenpää hospital 2016–17.**

http://www.evocons.fi

FAKE

FAKE PRODUCTION (2004) HELSINKI

- Fake is the largest and oldest CGI/VFX studio in Finland, specializing in digital animations and illustrations.
- The combination of real time graphics and high quality visuals know-how has made VR and AR the logical next step for Fake to take.
- Actively developing VR/AR technology and taking on customized client projects.
- VR/AR Portfolio contains works for clients such as OP, Neste and Patria.

http://www.fake.fi

finpeda
Innovations in education

FINPEDA OY (2008) OULU

- Creators of Finpeda Virtual Space (FVS), a browser-based multiuser virtual environment.
- Suitable for learning, training, marketing, presentations, user customization and communication.
- Create a company showroom, a classroom for students or a safety training simulation into a virtual world.
- Check out Finpeda's virtual spaces at fvs.meshmoon.com.

http://finpeda.fi/

360FILM

MARKETING

Flatlight
CREATIVE HOUSE

FLATLIGHT CREATIVE HOUSE (2012) ROVANIEMI

- Creative agency / production house specializing in VR & 360 video experiences.
- Fiskars - Lähteelle and 100 Moods From Finland among recent VR works.

http://www.flatlight.fi

360FILM

CONTENT MANAGEMENT

FLYCAM OY (2010) TAMPERE / TURKU

- Visual communication experts offering a wide range of services in 360 photography and video production for marketing.
- Hosting the Viwer content distribution platform for 360 footage.
- Clients in construction industry, traveling industry, real estate.

http://flycam.fi/

MATKAMUISTOIHIN

ASUNTOESITTELYYN

Leonidas

LEONIDAS OY (2008) TAMPERE

- Industrial XR multi-user and 360° solutions for training, education and sales.
- Providing platform and functionality to any 360° content.
- Developing multi-user environments for industrial need for planning, visualising and producing.
- Capability to develop tailored XR-solutions for all industries.
- We work with leading industry, education and public sector customers like Liikenneturva, TAKK, Valmet and Rejlers.

www.leonidasoy.fi

LYFTA
EXPLORE
DISCOVER
CREATE

LYFTA (2016) HELSINKI

- Serdar Ferit and Paulina Tervo, creators of Lyfta, acclaimed filmmakers with 15 years experience, have been using immersive storytelling since 2010.
- Lyfta is an immersive learning platform aimed at pupils aged 7 - 16. Currently operating in Finland and the UK.
- Pupils explore real-life stories in interactive 360-degree worlds with VR and AR, intuitive interaction design and powerful short films about places and people from around the world.
- Teachers have access to lesson plans, activity guides & exercises, based on the Finnish curriculum, adapted to other curricula.
- Released works: Awra Amba, Dinnertime 360 and Secrets of The Opera.

http://www.lyfta.com/

PEILI VISION (2015) OULU / HELSINKI

- Digital healthcare company, creators of a virtual reality platform for neurological rehabilitation.
- Enabling healthcare professionals to create customizable learning environments for their patients and see through the patient's eyes.
- Health Awards 2017 innovation finalist.

http://peilivision.fi/

CONTENT MANAGEMENT

PIXELFACE OY / VIZOR (2015) HELSINKI

- Creators of Vizor, a web-based platform for easy creation and sharing of 360 and VR content, released in 2015.
- Targeting web-based business in journalism, advertising, real estate, tourism, e-commerce among others.
- Next version of the platform is currently under closed beta, to be released in Q4 2017.

https://vizor.io/

Leveraging the WebVR-technology, Vizor is building a platform to power the next generation of immersive web content. Vizor's offering consists of complete end-to-end solution from WebVR authoring tools to one-click publish to anywhere in the web or social media. Vizor has deployed several successful pilot projects both in Finland and in the US, including VR experiences for Marimekko, Ateneum Art Museum and NBC. The future is looking bright and Vizor will be focusing on tighter integration to leading social media platforms and developing the platform to further support new market verticals.

MARKETING

TRAINING

HEAVY INDUSTRY

PLNYER

PLAYER ENTERTAINMENT (2014) HÄMEENLINNA

- VR for marketing, product development and training purposes for large and medium sized companies.
- VR game title also in development.
- Clients including KONE, Outotec, VTT, YLE and Tekes.

http://player.fi/

REALITY INFOCUS (2016) JOENSUU

- Graphics intensive VR content creators with background in game development and architectural visualization and design.
- Recent works: Purso VR experience and Roomio graphics showcase.

 http://finnreality.com/

VR SOLUTIONS FOR BUSINESSES

siili_

SIILI SOLUTIONS OYJ (2005) HELSINKI

- Creating modern digital services by combining the best expertise in business, design, data, technology, integrations and devices.
- More than 500 experts serving the largest Finnish companies and selected global front runners from offices in Helsinki, Oulu, Wroclaw, Berlin and Los Angeles.
- Front runner in 3D/AR/VR with customers in the automotive, construction and manufacturing industries among others.

https://www.siili.com/

HEAVY INDUSTRY

AEC

TRAINING

SKY HIGH VR (2014) TAMPERE

- Virtual Reality solutions for industry and architecture.
- Visualization and training simulations.
- Large scale environments, co-operative multi-user design spaces.
- Member of VARPU, a VR development consortium funded by Tekes.

http://skyhighvr.com/

STEREO○SCAPE

STEREOSCAPE (2008) HELSINKI

- Stereoscape creates interactive 3D, AR, MR and VR to build smart product communication solutions with measurable impact and value.
- Clients in VR/AR projects include ABB, Nokia, Robit Plc, Valmet and Wärtsilä
- Member of VARPU, a VR development consortium funded by Tekes.

http://www.stereoscape.com/
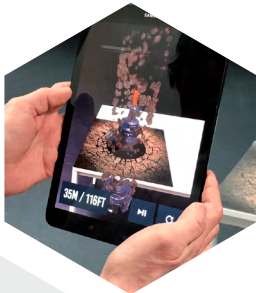
Stereoscape's mission is to help its customers to better communicate their products, services or processes through smart product communication. Smart product communication combines visualisation, storytelling, data, and technology and is seamlessly delivered to different platforms, be it AR or VR devices, smartphones or browsers. Stereoscape works with forward thinking, high-end customers already seeing the benefits of implementing AR and VR solutions across their product lines.

Many industrial players already employ 3D visualizations for marketing use. Translating them into interactive VR and AR applications is the next step Stereoscape helps its customers with. But by pushing the boundaries of these technologies to cover personnel training, field & maintenance services, as well as collaborative design and manufacturing pipelines will make the benefits of VR and AR even more prevalent. Stereoscape plans to be at the forefront it.

AEC

HEAVY INDUSTRY

MARKETING

TEATIME RESEARCH LTD. (2016) HELSINKI

- Deep experience & understanding in VR/AR tech & UX.
- Rapid development cycle with 30 products delivered in the first year.
- Strong own technology base with continuous development.
- High standard of visual quality and usability.

http://teatimeresearch.com/

th●re's no spoon

THERE'S NO SPOON (2016) HELSINKI

- Creators of immersive high-end VR & AR experiences and Cinematic VR productions.
- Company consists of experts with several years of experience working in film, advertising, post-production and technology.
- Recent projects include the Virtual Traveller app and work for Finnair and Aurinkomatkat.

http://www.nospoon.fi/

ᵗ·thɪnglɪnk·.

THINGLINK (2010) PALO ALTO / HELSINKI / ST PETERSBURG

- **A Software as a Service business bringing visual storytelling and mobile VR to education globally with industry-leading professional development and teacher education programs.**
- **Largest user-generated interactive 360 image database that helps students orientate to the subject of study, and create their own 360 tours and virtual experiences.**
- **Target audiences include teachers, educational organizations, school districts, cities as well as media companies.**
- **3 million teachers and students worldwide use ThingLink and create 250,000 new interactive stories per month.**

https://www.thinglink.com/
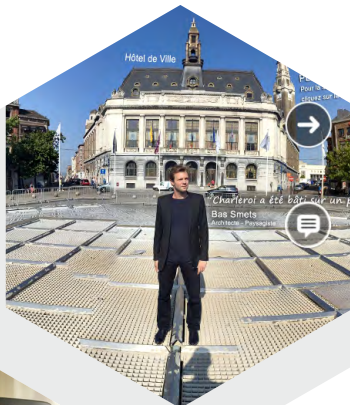
"I quit my PhD program at the faculty of education in Helsinki to build ThingLink. I had an early vision of an augmented reality experience that lets users learn more about the things they see by simply touching them. That is where the name ThingLink came from; it's a link that can turn anything into a point of navigation. Technically it's enabling hyperlinks for images so that one thing always leads to another!

Functional hyperlinks are especially critical in creating interesting immersive experiences. We believe anyone from elementary school onwards should be able to easily tell stories in 360 degrees. It's like giving them a chance to discover and explain the world in their own voice; students love it, and it builds their character, creativity and confidence!

It's good to remember that mobile VR is accessible to everyone with a smartphone or a tablet. When creation and consumption can happen on the same device, teachers and students are able to build virtual environments to teach each other. On a grand scale this leads to a user-generated a virtual universe with U.L.As (Universal Learning Assistants) that will transform the way we learn about the world."

Ulla Engeström, CEO of Thinglink

Tridify

TRIDIFY (2012) HELSINKI

- A Software as Service based VR content delivery service. Automated conversion from BIM to VR.
- Tridify is a collaboration, sales & management tool for the AEC industry.
- Scalable, cloud-based, cross-device compatible.
- Share and modify designs as dynamic virtual environments easily on mobile devices.

http://tridify.com/

VISUMO OY (2017) TAMPERE

- **Augmented 360 photography content for gamified education and marketing.**
- **Browser, tablet and smartphone compatible.**
- **Visumo is startup company with 4 employees.**
- **Gamified education materials motivate and make learning fun.**

http://www.visumo.fi/

VOYANT PICTURES (2016) HELSINKI

- **3D animation, cinematography, motion design and virtual reality for industrial design and marketing.**
- **An agile one-man operation with strong background in 3D animation, technical illustration and marketing.**
- **Multi-disciplinary visualization service for high-tech, industrial design, aerospace, entertainment and architectural sectors.**
- **25 year experience in high-end visual arts, 15 years in Hollywood production environments.**
- **International enterprise clients in US, Canada, UK, Australia and all around Europe.**
- **Virtual reality development on Unreal Engine for Oculus Rift platform since 2016.**

http://voyantpictures.com/

ZOAN

ZOAN OY (2010) HELSINKI / BELO HORIZONTE / LOS ANGELES

- **Interactive virtual reality, 3D-modeling, content design and creative planning for international clientele in building and property development and marketing.**
- **Six years experience from VR projects for Nokia, Petrobras, Ilmarinen, Varma and The Finnish National Museum among others.**
- **30 employees.**

http://zoan.fi/

ARILYN (2013) HELSINKI

- Arilyn is the leading Nordic AR platform provider
- Vision: Arilyn is the Photoshop of AR by offering best AR tools for storytelling professionals in marketing, media and entertainment
- Focus customers: B2B (leading consumer brands and agencies)
- Founders: Emmi Jouslehto (CEO), Otto Laurila (CTO) and Otso Kähönen (Creative Director)
- 14 employees

http://www.arilyn.fi/

deeptale

DEEPTALE OY (2016) HELSINKI

- **Deeptale is Helsinki-based company that creates rich and engaging mixed reality experiences for brands.**
- **End-to-end production capability combines creative-, design- and technology expertise.**
- **Has produced HoloLens experiences as well as mixed reality filters for clients in Finland and abroad.**

 http://www.deeptale.com/

HEAVY INDUSTRY

AEROSPACE

TRAINING

DELTA CYGNI LABS (2013) TAMPERE

- **Delta Cygni Labs Ltd. develops POINTR - a professional AR remote collaboration solution for industry.**
- **POINTR can be deployed to android phones and tablets, iPhone, iPad, Windows and Mac, as well as smart glasses, e.g. ODG, Vuzix and Epson.**
- **Operates globally in the machine building, pulp & paper, maritime, aerospace, working vehicles, and production equipment industry sectors.**
- **Customer references include KONE, Valmet, Wärtsilä, Fingrid, Thales Alenia Space, John Deere, AGCO, Pemamek.**
- **Established as a VTT spinoff in 2013, based in Tampere, Finland and has personnel of six with expertise is in VR & AR for industry**

https://www.deltacygnilabs.com/

FLYAR AUGMENTED REALITY STUDIO OY (2015) VANTAA

- **AR content studio.**
- **Core team of 3 that works with a network of freelancers.**
- **Experience with print media augmentation for marketing, showcase and educational purposes.**
- **Specializes in interactive 3D- and 2D- AR-experiences built on the award winning Zappar-platform.**
- **Clients include Lemminkäinen, City of Vantaa & Lujatalo.**

DOWNLOAD ZAPPAR ZAP ENJOY!

https://flyar.fi/

IMMERSAL

IMMERSAL LTD. (2015) HELSINKI

- World's first shared, large space infotainment AR platform.
- The venue gets an AR content management system, visitors use app with their own phones.
- Creates a new media & AR ad platform for the venue.
- AR features for end-users: Indoor navigation, finding friends, matchmaking, promos, games etc.
- Currently in use at Messukeskus Helsinki, one of the leading exhibition centers in the Nordics.

http://www.immersal.com/

→ SOFTABILITY

SOFTABILITY GROUP OY (2002) VANTAA

- Software development (.NET/Embedded/Cloud) and QA (test automation and manual) company with X-Reality expertise.
- We are a value-adding partner for our medical and industry customers in their R&D projects.
- Softability Studio team specializes in developing Augmented (AR), Mixed (MR) and Virtual Reality (VR) solutions.
- Studio offers customized AR/MR/VR applications for mobile and wearable technologies like Microsoft HoloLens, smart glasses and VR headsets.
- Softability Studio customer references: Thermo Fisher Scientific, Perkin Elmer, Skanska, Meyer Turku and Patria.
- We help our customers to turn X-Reality ideas to creative solutions.

http://softability.fi/

Sovelto

SOVELTO OYJ (1998) HELSINKI, TAMPERE

- Personnel training and information and communication technology consultation company of 65 employees.
- Clients in 2000 private companies and public organisations with 30 000 individuals trained yearly.
- Augmented and virtual reality initiative for remote assistance in the installation, upkeep and maintenance of machinery, logistics and the built environment starting in Q4 2017.
- The objective of the initiative is to find the best devices and practices for field service remote helpdesk concepts and eventually train clients' staff in their use.

http://sovelto.fi/vrar-hanke

CONSUMER ENTERTAINMENT PRODUCTS

FINLAND has a long and strong legacy in the games industry, which explains why game development background is relatively common among new Finnish VR developers. VR game development is a business of passion and innovation, where pioneering new gameplay methods, game mechanics and storytelling techniques is at the heart of it all. In addition to game development, many game developers are actively seeking new opportunities in the B2B sector to showcase their VR know-how.

The VR games market is currently an extremely competitive and challenging market to maneuver, where content supply largely exceeds customer demand. The demand will naturally increase in the future as VR devices will become more common among consumers. In the meantime various services that provide people first VR experiences, such as VR arcades and cinemas, are extremely important in educating the public and creating local distribution channels for content creators. Interest towards VR and AR is at an all time high, so consumer entertainment services are a lucrative business as well. Another development worthy of mentioning in the Finnish consumer entertainment field is the emergence of augmented physical exercise / VR exercise, which likely will raise its profile globally in professional eSports and casual exercise in the coming years.

3RD EYE STUDIOS™

3RD EYE STUDIOS (2016) HELSINKI

- Founded specifically for high-end VR game development, 3rd Eye Studios makes innovative games and groundbreaking VR developer tools.
- Team consists of Finnish game industry veterans from Remedy, Unity, Bugbear, Redlynx.
- Launched its first VR game Downward Spiral: The Prologue at the end of March 2017.
- Further episodes and VR technology will be launched in 2018.

http://www.3rdeyestudios.fi/

"If you want something done right, do it yourself", is a proverb 3rd Eye Studios has faced upon taking the task of creating world leading VR games and developer tools. As gamers around the world are waiting for more innovative VR game experiences, developers are waiting just as eagerly for better tools to work with.

With great tools, developers won't have to invest as much into mastering the intricacies of game engines or solving basic problems with interactions, locomotion mechanics, animations and lighting, all of these being challenges that have already been addressed elsewhere and are possible to be bundled and delivered.

Instead, all that valuable time is free for developing better game content, which makes starting VR development significantly easier technically and reduces the early financial risks of startups. This is something 3rd Eye Studios intends to deliver with the 3rd Eye Core, to be released in 2018.

ATAVERTI (2008) HELSINKI

- Ataverti is a one-man game studio based in Helsinki.
- Developer of Led It Rain, an early access motorcycle shooter game for PC, which is currently being converted into VR.
- Other game projects under work include Panzer Rex and Rapier Phantom.
- FIVR Helsinki Hub associate.

http://www.ataverti.com/
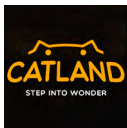
CATLAND STUDIOS (2017) HELSINKI

- VR game development studio from Tampere, selected into Nordic VR Startups incubation program in July 2017
- Team of five with the goal of making exciting virtual reality experiences
- Currently residing in Helsinki for the duration of the incubator program
- Taphouse VR is coming to Steam in 2017

https://www.catland.studio

CITOR3 (2016) KLAUKKALA

- Indie adult entertainment studio operating globally.
- Sensual simulations made with good taste for both sexes and several sexual orientations.
- Two released products so far and many more in production.
- Collaboration with Penthouse, Playboy and Hustler among others.

🌎 http://www.citor3.com

🌎 http://amoreon.com

![EVACRITY VR]

EVACRITY (2017)

- Exploring possibilities of combining VR and physical exercise.
- Fitness and military oriented video content creation.
- Promoting more physically demanding and realistic approach to competitive gaming.
- Bringing VR closer to military and security training.

http://evacrity.com/

EVOCAT GAMES (2017) HELSINKI

- Evocat Games is a VR game development startup. The company specializes in asymmetric multiplayer games, meaning games that put players in different perspectives with different gameplays.
- The team gathered in Kajaani University of Applied Sciences, where they shipped their award-winning student project, Nemesis Perspective.
- Evocat Games is currently developing Nemesis Realms, a sequel to their first title.

http://www.evocatgames.com
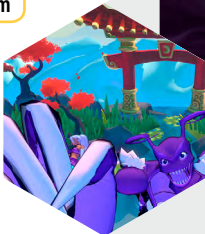
HIPFIRE GAMES (2017) HELSINKI

- Creating VR games that can build communities around them.
- Innovator in VR multiplayer mechanics and usability - we want to make great VR content that anyone can enjoy, no matter your background. We believe that having fun with your fellow players is the best retention tool you can have.
- Team with a long game development background in some of the most successful Finnish game studios.

http://www.hipfirevr.com
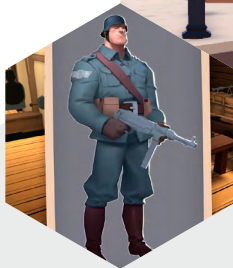
ICEFLAKE STUDIOS (2007) TAMPERE

- **Iceflake studios develops quality games for hardcore PC and console players.**
- **Extensive portfolio of game releases for PC, console and mobile platforms, background in the PC modding community.**
- **Ice Lakes (2016), Iceflake's first VR compatible game, is just as great with or without VR.**
- **In addition to game development, Iceflake is available for B2B projects.**

http://iceflake.com/

KUTOMO (2016) HELSINKI

- **Kutomo is creating story-intensive, interactive game experiences in virtual reality.**
- **Breaking the boundaries between films and games in VR with narrative sandboxes.**
- **Currently in stealth mode, no info released yet.**

http://www.kutomo.net/

LUCKY YOU STUDIO (2011) HELSINKI

- Lucky You Studio is a game startup, fully focused on high-end VR game development.
- First team to release a commercial VR game in Finland. Kumoon: Ballistic Physics Puzzle came out in late 2015.
- Currently working on two VR game projects.
- FIVR Helsinki Hub associate.

http://luckyyoustudio.com/
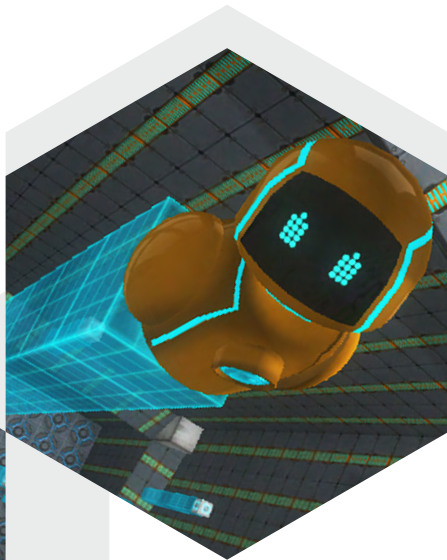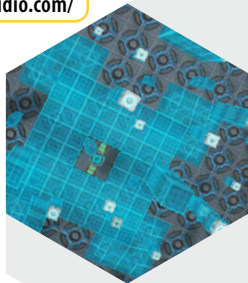
MORROW GAMES (2013) TURKU

- **Morrow Games is a VR studio creating high quality 3D graphics, VR games and applications.**
- **Two VR games released so far. Crowmire (Steam Greenlight 2015) and Escape Artist: The Trial (Steam 2016.)**
- **The studio has currently four VR-compatible game prototypes and two VR customer projects under work.**
- **FIVR Turku Hub associate.**

www.morrowgames.com

REFINE REALITY (2016) KUOPIO

- VR game studio with focus on mobile standalone VR and XR.
- Expertise in interactive game design and rapid prototyping.
- Released the game Earth Defence Program: Wayfarer for GearVR in 2017.
  Currently has 2 new games in the works.
- Founded and owned by Sampsa Kuha.
- Subcontractor for 3DTalo Finland Oy in B2B XR-projects.

http://www.refinereality.com/
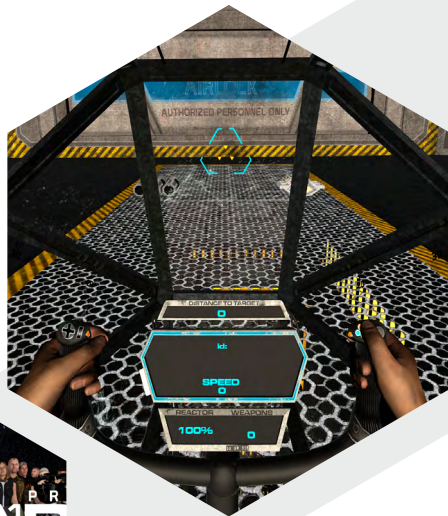
VIRTUAL DAWN (2012) TAMPERE

- VR/AR multimedia company with focus on games.
- Currently finalizing first VR game, Outrageous Grounds: The Maze.
- Team of six has extensive CGI experience in animation, design and visual effects.
- Available for b2b VR projects and consultation, ready to expand horizons.

http://virtual-dawn.com/

GAMES

DEVELOPER TOOLS

VI VERSION

VIVERSION (2016) TURKU

- Independent game studio of four focusing on VR game and tools development.
- First VR game, Lockdown: Stand Alone, was released December 2016 in Steam.
- VRDOC is a Dynamic Occlusion Culling system designed for VR, available for purchase in the Unity asset store.
- VRDOC is easy and quick to set up and offers great performance benefits.

https://www.viversion.com/

AUGMENTED CLIMBING WALL
VALOMOTION⁺

AUGMENTED CLIMBING WALL / VALO MOTION OY (2016) HELSINKI

- **Valo Motion Oy combines motion games and real sports for physical exercise and fun.**
- **First product, Augmented Climbing Wall, is a projector and computer vision based, licensed AR game experience for indoor activity parks, fitness & climbing gyms, and entertainment sector.**
- **Interactive, gamified wall climbing experience makes physical exercise fun.**
- **Augmented Climbing Walls have been sold to 25+ countries around the world.**
- **Co-founder and CEO Raine Kajastila (D.Sc.(Tech.)) had previously founded 2 companies Hipui and Blaast (later Pryte Holdings). Pryte was acquired by Facebook in 2014.**

http://augmentedclimbing.com/

VR   ARCADE

PORTAALI

PORTAALI (2017) TAMPERE

- Portaali, located in Tampere, is the second VR arcade in Finland. Opened for business in the summer of 2017.
- Run by six entrepreneurship students who share a passion for VR.
- Aims to offer the best currently available virtual reality experiences to everyone at an affordable price.
- Promotes the local VR-gaming industry by partnering with Finnish developers.

https://www.portaali.fi

PIKSELI
ARCADE

VIRVA VR OY (PIKSELI ARCADE)
(2016) VANTAA / ESPOO

- Scandinavia's first virtual reality park.
- Founded by Kari Koivisto and Jan Hursti.
- First site opened in Flamingo Entertainment Center in January 2017. Second site will open in Espoo in September 2017.
- VR equipment is expensive and we want to give people the chance to try virtual reality without having to spend a fortune on the equipment.

http://pikseli.fi/

THE VIRTUAL REALITY
CINEMA
FINLAND

VR CINEMA FINLAND (2017) TAMPERE

- **The first virtual reality cinema in the nordic countries.**
- **Exhibits hand-picked 360 film content from around the world.**
- **Operates in Tampere, available for customized exhibitions anywhere.**
- **Contact for inquiries: Tuukka Tuovinen p. +358400585018**

www.vrcinema.fi

TECH DEVELOPMENT

CURRENT consumer VR and AR devices and applications are a result of several breakthroughs in display technology, optics, computer vision and graphics. Further innovation in these fields is required in order to take immersive technologies to new heights and realize the groundbreaking visions for VR and AR. Finnish companies have world-class knowhow in the high tech fields that are crucial to the evolution of XR technologies, and they are ready to take on the many challenges involved.

BASE MARK

BASEMARK (2015)

- Software and graphics rendering solution providers from Helsinki.
- Basemark develops Rocksolid Engine, an industrial grade graphics rendering solution tuned for optimal performance and safety. Rocksolid offers almost 10 times the performance compared to other graphics rendering solutions.
- Basemark also offers Performance measurement tools for CPU and GPU evaluation, many of which are based on industry standards such as OpenGL and Vulkan graphics APIs.
- Our team has graphics development and automotive field experience that we are utilising in our daily work to revolutionise graphics industry

https://www.basemark.com/

Prior to founding the company in 2015, Basemark's core team accumulated 15 years of experience in graphics performance measurement and the automotive industry. Extensive co-op with all major computer graphics companies has given Basemark the tools to create world-leading graphics solutions.

Rocksolid Engine is the fastest industrial grade graphics engine on the market. Performance comparisons with current leading game engines have revealed that Rocksolid is capable of severely outperforming its peers. It boasts 115% more FPS, doubled energy efficiency and 9 times less CPU resources used. This doesn't automatically mean that Rocksolid has to compete against Unity or Unreal, as it can be employed as a complementary graphics drawing solution for special needs. Industrial grade graphics means that Rocksolid is capable of fulfilling industrial standards of reliability, start-up time and resource and energy efficiency, making Rocksolid the ideal graphics solution for industrial solutions that require maximum efficiency. This has also been acknowledged by Basemark's strong international clientele in the aerospace, automotive, IT, chemical and heavy industry.
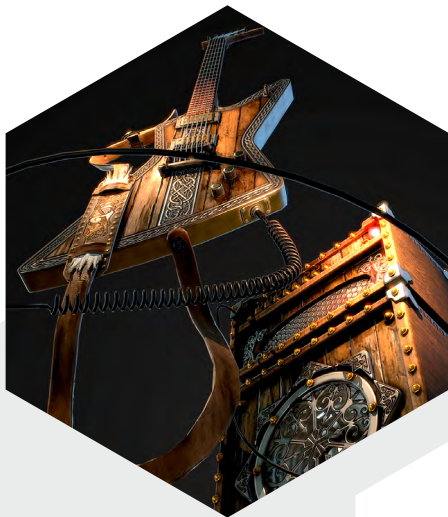
brighterwave

BRIGHTERWAVE (2014) TAMPERE

- Novel augmented reality (AR) eyewear products to consumers and professional use.
- Products are based on Brighterwave's retinal scanning display technology where the image is scanned directly to the eye using a laser projector and hologram
- Eyewear products look like ordinary (sun)glasses. They are wireless, eye safe and have excellent image quality.

https://brighterwave.com/

Eye

Laser projector

Hologram
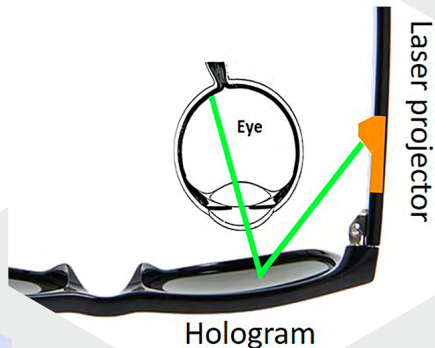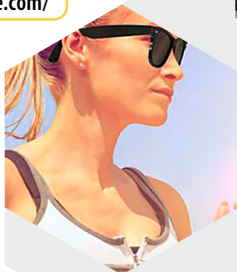
DISPELIX (2015) ESPOO

- Dispelix provides see-through-displays modules for augmented reality glasses developers and manufacturers.
- Our priority technology provides flawless image with human eye matching resolution.
- Dispelix Modules enables normal eyewear form factor already today.
- Dispelix is a spin-out company from VTT technical research Centre of Finland

http://www.dispelix.com/

FUTUREMARK

a UL company

FUTUREMARK (1997) HELSINKI

- **The world's leading independent benchmark developer since 1997.**
- **We create the popular 3DMark, PCMark, and VRMark benchmarking tests.**
- **Our benchmarks are used throughout the industry and by hundreds of press publications.**
- **We provide accurate and impartial performance benchmarking for PCs, tablets, and smartphones.**
- **VRMark has helped thousands of people find out if their PC is ready for VR.**
- **New VR benchmark tests for DirectX 12 and mobile devices coming soon.**

https://www.futuremark.com/

Microsoft
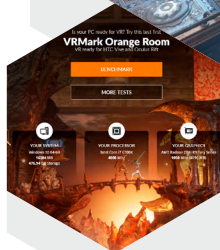
WINDOWS MIXED REALITY / HOLOLENS

- Hololens: First self-contained, holographic computer.
- Enables to engage with your digital content and interact with holograms in the world around you.
- Transforms the ways we communicate, create, collaborate and explore.
- Windows Mixed Reality expands the experience into third party headsets in December of 2017

https://www.microsoft.com/en-us/hololens

OPTOFIDELITY

OPTOFIDELITY (2005) TAMPERE, CUPERTINO, SHENZHEN

- Test automation solutions for Smart devices ecosystem. For both R&D and production.
- Measuring performance of VR hardware with the Optofidelity VR Multimeter.
- Working in co-operation with major VR device manufacturers.
- Public reference customers: Intel, Google, Atmel, China Mobile, Turkcell

https://www.optofidelity.com/
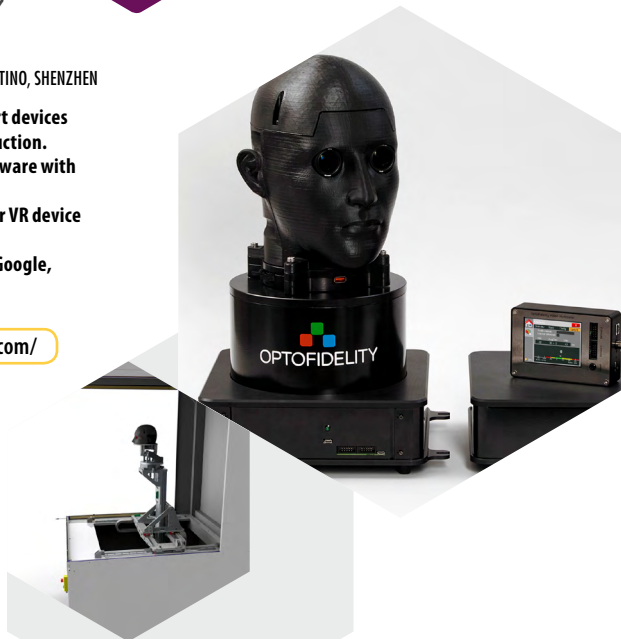
umbra

UMBRA (2006) HELSINKI

- Experts in 3D graphics optimization, whose products are today primarily used in AAA video games, such as the Call of Duty series, Fallout 4, DOOM, the Witcher 3 and many more.
- Building a new cloud-based product for optimizing, hosting and delivering massive 3D data sets to any device. This new product makes it possible for example to visualize large-scale architectural models on the Hololens or GearVR.
- Offices in Helsinki, Tampere, San Francisco and Seattle.

http://umbra3d.com/

VARJO TECHNOLOGIES (2016)

- **Varjo is creating next generation display hardware and immersive computing products.**
- **Delivering eye resolution headset technology preview unit starting Q4 2017, with commercial product to be released by the end of 2018.**
- **Video-see-through capabilities lets the Varjo HMD operate in VR and MR.**

http://www.varjo.com/

Varjo's technology gives up to 70 times the screen resolution of current VR headsets.

Founded by IT and game industry veterans from Nokia, Intel, Nvidia and Rovio in 2016, Varjo finally stepped out of the shadows in the summer of 2017 with their product announcement of a mixed reality headset in eye resolution, proclaiming a game-changing entrance to the XR hardware market.

The Varjo headset's combination of video-see-through features, advanced optics and eye-tracking technology promise up to 70 times the screen resolution of current VR headsets with additional mixed reality functions. These features might prove invaluable in professional use cases, as resolution has been one of the inhibitive bottlenecks of current VR headsets.

The announcement and subsequent showcases generated a lot of excitement around the world, as visions of such resolution levels have only been futuristic pipe dreams until now. Little is still known about Varjo's technology outside few rare, albeit convincing showcases, but first preview units roll out to selected partners already in Q4 2017 and a consumer launch should happen in late 2018.

OTHER COMPANIES OPERATING IN THE FINNISH XR ECOSYSTEM

Well over 100 companies are associated with the Finnish XR ecosystem. The companies listed below did not participate in this study, but are acknowledged by FIVR as formidable actors on the Finnish XR stage.

- 3D Avenue International
- 3D Render Oy
- 3D Studio Blomberg
- AR Games Helsinki
- Admino Technologies
- Augumenta Oy
- Creanex
- CSE Entertainment
- CTRL Entertainment
- Cubicasa
- Dark Amber Softworks
- Donkey Hotel
- Eligo Studio
- Elomatic
- Evocat Games
- Exerium
- Finwe
- Gofore

- HiQ Finland
- Idean
- Imagesoft
- Intopalo
- Ixonos Oyj
- Kii
- Leonidas
- LudoCraft
- Make Films
- Mapgets
- Mevea
- Nuviz
- Oulu3D
- OwnSurround
- Pinovuo Oy
- Playsign
- Process Genius
- Rakka Creative

- Reaktor
- Renderize
- Satavision
- Sayduck
- Sensetrix
- Silvermile Entertainment
- SVS Innovations
- Upknowledge
- Valakia Interactive
- Ve-Top
- Versoteq
- Vincit
- Virtual Traveller / 1 Enormous Elephant
- Visible Realms
- Visual Components
- VividWorks
- Wanderfeel

Tekes

- **Tekes, the Finnish Funding Agency for Innovation is the most important public funding organization in Finland to support VR/AR/MR industry. From the beginning of 2018 Tekes will be part of Business Finland organization.**
- **Tekes' campaign, Team Finland Mixed Reality, provides funding for companies that develop solutions and utilize Virtual, Augmented and Mixed Reality in their business operations, and build expertise in Finland.**

The Mixed Reality campaign aims are:
- **Finland has world's leading companies producing VR/AR/MR technology and content.**
- **Finnish companies are global forerunners in developing and utilizing VR/AR/MR.**
- **The Finnish VR/AR/MR ecosystem is connected to other, major ecosystems around the world.**

https://www.tekes.fi/en/

![FIVR - Finnish Virtual Reality Association]

- FIVR (Finnish Virtual Reality Association) is a non-profit organisation in Finland dedicated to advancing the state of Virtual, Augmented and Mixed Reality development. Our goal is to make Finland a world leading environment in all XR activities.
- FIVR fosters the Finnish grassroots XR development environment by functioning as an information nexus, expert organization and communication facilitator between all parties interested in XR development.
- We offer concrete development resources like free devices and office spaces, consultation, contacts and mentoring for up and coming artists, entrepreneurs and academics through the FIVR developer hub program, which currently has a presence in Helsinki, Espoo, Tampere and Turku.
- FIVR organizes bimonthly developer meetups and is a supporting partner in hackatons and larger events like X Reality Day, Arctic15 and Slush.
- FIVR is open to anyone and warmly welcomes everyone interested in latest developments of immersive technologies to join.

https://fivr.fi/

NORDIC VR STARTUPS

- Nordic VR Startups is an accelerator focused on helping the Nordic VR/AR/MR ecosystem to impove and grow. We provide participating companies with up to 100k€ in dedicated seed funding to develop their products and services. Additionally, the program offers developers mentorship opportunities, workspaces, and back-office services. Nordic VR Startups is a joint project between gumi, a leading Japanese gaming company, and Nordisk Film, a leading Nordic media company.

http://nordicvrstartups.com/

VIRTUAL REALITY FINLAND RY

VR FINLAND

- **Virtual Reality Finland ry is an association supporting the development of the XR ecosystem in Finland. The association is founded to help Finland become the leading country in developing and taking advantage of XR technologies. VR Finland is open to everyone and welcomes both individual and corporate members. Currently, VR Finland has almost 500 members.**
- **VR Finland focuses on connecting people, distributing information and working as a catalyst to speed up projects that would not otherwise start. Concrete examples include monthly VR Afterworks, VRAR Hämeenlinna event, Give Access Project, various speech engagements, Mindtrek Immersion, and VR Aamu.**

www.vrfinland.fi

VR FIRST KAJAANI

- VR First is an initiative designed to provide state-of-the-art facilities to creators interested in exploring the power and potential of virtual and augmented reality development. The goal of VR First is to build a worldwide network of VR/AR developers by facilitating access to infrastructure and promoting the formation of a global knowledge base. Currently there are 40 VR First laboratories around the world, and Kajaani University of Applied Sciences was fortunate to be one of the first universities in the Europe.

- VR First laboratory in Kajaani offers companies and students a development infrastructure to test and create virtual reality content. The VR First program also offers students the possibility to get personal tutoring on VR production from one of the VR trainers provided through VR First Initiative. VR First is one of the key reasons why KAMK has one of the best virtual reality laboratories in whole Scandinavia.

https://www.vrfirst.com

FINEDUVR

- **Main goals of the FinEduVR collaboration are to share information about possibilities of virtual reality in education and test different VR/AR platforms at schools. Participant high schools in the program are Muurame (Muuramen lukio); Kuopio (Kuopion klassillinen lukio) and Jyväskylän lukiot (Schildt and Lyseo). The project is funded by the Finnish National Board of Education.**

http://fineduvr.fi/

VTT ALVAR ESPOO

- **Augmented Reality research at VTT was established in year 2001, which makes VTT the oldest AR player in Finland and one of the first pioneers worldwide. Throughout the years, VTT's AR team in Otaniemi has produced world leading solutions for various application fields, including media and marketing, entertainment and games, interior design, collaborative telepresence interaction, building and construction, and industrial applications such as assembly and maintenance. Today VTT concentrates on professional AR, with industrial customers both in Finland and abroad.**

- **VTT's world leading 3D Tracking technology is available as the ALVAR SDK. A marker based Windows version of ALVAR was open sourced in 2012. Current development is done on the commercially available ALVAR Mobile SDK offering markerless point cloud based tracking on cross-platform devices. Additional ALVAR modules include ALVARforUnity and ALVARforHoloLens.**

ALVAR open source users include companies such as Google, NASA and MIT, while commercial licenses have been signed with e.g. Autodesk and Vuzix.

www.vtt.fi/multimedia

VTT SMACC LAB TAMPERE

- **VTT has studied VR, AR and MR in their Tampere laboratory for over 25 years with the focus of human-machine systems design and evaluation. The lab is currently at its fifth generation, featuring a wide range of different state-of-the-art display, tracking and control systems for developing immersive technology applications. The lab's variety of equipment makes many different approaches to collaborative design for workplaces and field maintenance applications possible. In 2015, the European Space Agency ESA commissioned R&D of an AR application system from VTT to be used at the International Space Station ISS. It is currently under development at VTT SMACC Lab Tampere, with first practical tests already done at ESA's training grounds at the European Astronaut Centre in Cologne, Germany.**

http://smacc.fi/labs/virtual-mixed-augmented-reality/

Tekes

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