EQUIPMENT CATALOGUE

Tampere University
MOTION CAPTURE STUDIO

Full-scale motion capture studio

CIVIT is equipped with a 16-camera Optitrack motion capture system, which can also be deployed elsewhere with relative ease. The optical motion capture system is used in the cinema and gaming industries to capture movement from real actors and transform them into realistic animations on virtual characters. Aside from creating animations, the same system can also be used to track anything in sub-millimeter accuracy in spaces in the scale of 10x10 meters.

LIGHT FIELD EVALUATION SETUP

CREAL’s near-eye light field display integrated with an autorefractor (Grand Seiko WAM5500)

The setup enables thorough characterization and analysis of (perceptual) light fields based on various perceptual measurements such as perceptual spatial resolutions, focus cues, etc., in both central and peripheral visual fields.

OMNIDECK

Omnidirectional virtual reality treadmill

The Omnideck is a 360° platform that can be used to enhance analysis and exploration into any field or industry, allowing full immersion before implementing practical changes. It enables you to perform natural instinctive movement, in any direction within the virtual world.
**NOKIA OZO 360 CAMERA**

3D 360° virtual reality camera for capturing video and audio, frame rate: 30 fps

The Nokia OZO is a professional 360° camera for recording stereoscopic video and audio with exceptional quality. It has eight microphones and lenses that each have a 195-degree field of view. You can monitor the activities of the frame in real-time with OZO, as it offers a live preview of the footage being captured.

**GOPRO OMNI 360 CAMERA**

8K 360° camera for creating high-quality virtual reality content

The GoPro Omni is a 360° camera for creating and distributing impressive immersive virtual content. It is a multi-camera rig that enables high-resolution output and quality and integrated pixel-level syncing that minimizes motion artifacts.

**ORAH 4I 360 CAMERA**

360° camera with 170° field of view and full-spherical area coverage (360° x 80°), frame rate: 30 fps

With Orah 4i you to live stream 4K 360° video, capture or post-produce your 360 content. It is very easy to setup thanks to the camera calibration that has been done automatically upon root.
**INSTA360 PRO2 360 CAMERA**

*Professional VR camera with 6 x F2.4 fisheye lenses and real-time stitching: 3840 x 3840 at 30fps (3D). Includes Wifi & GPS antenna, ethernet*

The Insta360 Pro 2 uses six cameras to capture every angle of a scene at once. Videos and photos are then fused into two 8K 360 images to create immersive, detailed 3D VR. The Insta360 Pro 2 offers long-range live monitoring, FlowState stabilization and simplified post-production.

**MH ACOUSTICS EIGENMIKE® DIRECTIONAL MICROPHONE**

*Spherical microphone array composed of 32 high-quality microphones*

The Eigenmike® microphone can be used for real time multichannel surround sound recording or close-talking applications in sound production for music, film or broadcast, gaming, consumer products, sports or news reporting for example.

**BLACKMAGIC URSA MINI PRO 4.6K**

*Lightweight digital film (60 fps) camera that supports EF photographic lenses and PL, B4, F-mount lenses*

The Blackmagic URSA Mini Pro is a professional digital film camera that has an amazing image quality. It is lightweight and ergonomically designed and it has the controls and features of a traditional broadcast camera.
**OPTRONIS CP70-12-C-167 4K INDUSTRIAL CAMERA**

12 Megapixel camera (166 fps)

The Optronis CP70-12-C-167 4K is an industrial CoaxPress camera recording up to 166 fps with full resolution. The camera is compatible with F-mont lenses with manual aperture control of G-type lenses meant for Nikon DSRLs.

**LYTRO ILLUM LIGHT FIELD CAMERA**

40 megaray light-field camera with constant F/2.0 8X optical zoom and 4” tilt screen

The Lytro Illum is a light field camera that allows the users to refocus their pictures after shooting. The camera is capable of amazing effects and it offers a good control.

**RAYTRIX R29 3D LIGHT FIELD CAMERA**

Mountable light field camera (6.2 fps) with 29 megapixel, 6576 x 4384 pixels resolution

The Raytrix R29 is a 3D light field camera that offers high resolution with large, low noise pixels. It can be used for 3D depth estimation, 3D stereo, multiviews and software refocus.
**SENOP HYPERSPECTRAL CAMERA**

Hyperspectral camera with fixed optics and adjustable exposure time.

Senop hyperspectral camera is a frame-based spectral system providing snapshot images in VIS-VNIR spectral range. The camera is the only snapshot device on the market providing real spectral response in each pixel. CMOS image sensor, dynamic range of 12 bits. Frame rate with 10 ms exposure time and 1010 x 648 pixels image size.

**FLIR A315 THERMAL CAMERA**

IR temperature sensor GigE (motorized focus), Plug-and-play, high-frequency streaming, 320 x 240 pixel microbolometer

The FLIR A315 is a compact thermal camera that is fully controlled by PC. It streams full-frame 16-bit images at 60 Hz with radiometric data, signal and temperature linear.

**FOTONIC E-SERIE 16W ToF CAMERA**

3D Smart camera with 45° x 34° field of view, 58 fps

You can run continuous measurements up to 58 fps with the Fotonic E-serie ToF Camera. It sends the measurements to a computer for display or further processing.

**ODOS IMAGING VS-1000 ToF CAMERA**

Time-of-flight depth camera, high resolution, 30 fps (streaming video), 450 fps (burst mode)

The Odos captures 3D and 2D images of the same scene from a single camera with its unique ToF technique.
OPTITRACK V120:TRIO

Plug-and-play bar with 3 cameras for 6 DoF motion tracking, 120 fps, 640 × 480 resolution (VGA, windowed from 752 × 480)

The OptiTrack V:120 Trio is a self-contained, factory-calibrated tracking system with an accurate and flexible optical tracking technology.

OPTITRACK PRIME 17W

Motion capture camera, 360 fps and 1664 x 1088 resolution

With the Optitrack Prime 17W you can use fewer cameras for a full 360° shot with an amazing 70° field of view. It also allows you to capture motion in a small space.

OPTITRACK PRIME 41

Motion capture camera with industry-leading precision, 180 fps and 2048 x 2048 resolution

The Optitrack Prime 41 is the largest volume motion capture camera in the world. It has exceptional precision, unprecedented range and huge capture volume. It also enables outdoor motion capture.
KUKA KR 16 L6-2 ROBOTIC ARM

*Industrial, programmable, 6-axis robotic arm with repeatability of 0,05 millimeters. Supports payloads of up to 6kg.*

Kuka KR is a programmable industrial robotic arm that can be used for high-precision camera control. It is a self-mounted robot that has a long reach of 1,9 meters.

Kuka is extremely precise, it has high-performance gear units and powerful motors. In addition, it has a slender robot wrist and a special arm extension of 300mm that enables the work envelope to expand to a diameter of 4,2 meters.

ROBOTNIK MOBILE PLATFORM - ROBOT SUMMIT XL STEEL

*Robotic development platform with omnidirectional wheels.*

Summit-XL Steel is a robotic platform for application development, which can be configured with various sensors. It also has both internal and external connectivity.

The robot base can navigate autonomously or it can be teleoperated. Autonomy: 10h continuous motion and 40h standard laboratory use.

Suitable for indoor and outdoor use. Top speed of 3 m/s and 130 kg payload.
**DJI RONIN CAMERA GIMBAL**

*Handheld 3-axis gimbal system*

Ronin is a professional, stabilized gimbal system with powerful motors, custom sensors, and advanced algorithms. It is extremely precise and it has three operation modes: upright mode, underslung mode and briefcase mode.

Maximum Controlled Rotation Speed: Pan axis: 90°/s, Tilt axis: 100°/s, Roll axis: 30°/s

Controlled Rotation Range: Pan axis control: 360°, Tilt axis control: +45° to -120°, Roll axis control: ± 25°

**GRYPHON DYNAMICS X8 DRONE**

*Industrial drone for high payload missions*

The X8 has state-of-the-art brushless motors and carbon fiber propellers that make it great for filming. The X8 can fly the biggest cinema cameras and it can be used in challenging weather conditions.

**DJI INSPIRE 1 PRO**

*Filmmaking platform/drone*

The DJI Inspire 1 Pro and Inspire 1 RAW are the smallest, easiest professional aerial filmmaking platforms in the world. They combine DJI’s unparalleled leadership in aerial technology with world-class M4/3 imaging capabilities.
**PUPIL LABS CORE EYE-TRACKING GLASSES**

Eye tracking headset with 120Hz world camera and 200Hz binocular eye cameras

Connect your Pupil Core headset to a desktop or laptop. View and record real-time gaze and pupil data. Interface with other devices with our network-based API.

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**SMI EYE TRACKING GLASSES 2 WIRELESS**

Lightweight glasses for mobile eye tracking, sampling rate up to 120Hz

SMI-ETG are designed to record a person’s natural gaze behaviour in real-time. The device is provided together with software to design various types of experiments and transform the tracking data into more structured and meaningful representations.

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**MICROSOFT HOLOLENS**

Holographic head-mounted computer and display, holographic resolution: 2.3M total light points

Microsoft HoloLens offers a unique, hands-free AR experience with its excellent hologram resolution and spatial sound.
HTC VIVE PRO
- VR Headset
- Display: AMOLED
- Resolution: 2880 x 1600
- Refresh rate: 90 Hz
- Field of view: 110°

HTC VIVE
- VR Headset
- Display: OLED
- Resolution: 2160 x 1200
- Refresh rate: 90 Hz
- Field of view: 110°

OCULUS GO
- VR Headset
- Display: Fast-Switch LCD
- Resolution: 2560 x 1440
- Refresh rate: 60-72 Hz
- Field of view: 100°

OCULUS QUEST
- VR Headset
- Display: OLED
- Resolution: 2880 x 1600
- Refresh rate: 72 Hz
- Field of view: 100°

HP WINDOWS MIXED REALITY HEADSET
- MR headset (developed edition)
- Display: LCD
- Resolution: 2880 x 1440
- Refresh rate: 90Hz
- Field of view: 95°
HOLOGRAFIKA HOLOVIZIO
722RC LIGHT FIELD DISPLAY

Glasses-free 72” 3D Light Field display, 73 Mpixel 3D resolution

The Holovizio offers realistic 3D visualizations of rendered content with its 74 million individually controlled light rays at a 1-degree angular resolution in a 70-degree viewing angle. It has a highly stable 3D image and continuous motion parallax that provides a “look-behind” capability.

ZSPACE 100

Stereo display that can be connected to PC with HDMI and USB, 6 DoF stylus interface, 1920 x 1080 full HD resolution

The Zspace 100 is a 23.6” 3D display that enables unique natural interaction with virtual-holographic 3D imagery.

ALIOSCOPy 3D UHD 31.5” SV

Glasses-free ultra-high-definition 3D display

The Alioscopy 3D UHD SV is an autostereoscopic 31.5” lenticular sheet-based 3D display panel that steers different pixels of the underlying 4K panel to different directions. It shows 3D images instantaneously.

DIMENCO 50” AUTOSTEREOSCOPIC DISPLAY

Gla50” glasses-free 3D display

Dimenco Autostereoscopic display utilizes a lenticular technology that attaches a 3mm lens on top of a 4K resolution display panel.
FARO LASER SCANNER FOCUS 3D

3D laser scanner with a range of 130 meters and resolution up to 70-megapixel color. Field of view: horizontal 360° / vertical 300°.

The Faro laser scanner focus 3D is a precise and powerful high-speed 3D scanner for various applications. It has a scanning rate of one million points per second and a scanning range up to 130 meters.

VELODYNE VLP-16 LIDAR

PUCK™ sensor with a 100-meter range. Field of view: horizontal 360° / vertical ± 15°

The Velodyne Lidar PUCK™ is a small, real-time 3D lidar sensor that has all the Velodyne’s key features such as calibrated reflectivity measurements. The Puck is very resilient in various conditions and has a low power consumption.

You can find the full list of CIVIT equipment on our webpage. For further information, please contact us:

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