

Marco CAVALLO

PERSONAL DATA

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RESEARCH AREAS AND DOMAINS OF EXPERTISE

Primary: VISUAL ANALYTICS, DATA VISUALIZATION, AUGMENTED / VIRTUAL / MIXED / HYBRID REALITY, HUMAN COMPUTER INTERACTION, USER INTERFACES, FULL-STACK SOFTWARE ENGINEERING

Secondary: DATA SCIENCE, MACHINE LEARNING, COMPUTER VISION, COMPUTER GRAPHICS, MOBILE, INTERNET OF THINGS, WEARABLE SENSORS, ELECTRONICS PROTOTYPING

Coding: Javascript, Python (Primary) | C#, C++, Java, PHP (Secondary)

Tools: React, D3.js, Three.js, Unity3D | Node.js, Flask, Scikit-learn, Keras, Pandas, Numpy

WORK EXPERIENCE

<p><i>Current</i> JUN 2016</p>	<p>Research Software Engineer at IBM RESEARCH, New York</p> <p>Research focused on <i>Intelligence Augmentation</i>, i.e. using information technology to supplement and support human thinking, particularly in the context of data analysis and artificial intelligence interpretability. Development of interactive visualization systems to explore complex datasets and to improve the machine learning development life cycle. These systems typically combine web tools and AR/VR applications with ML pipelines, IoT sensors and wearable devices. Member of the <i>Intelligent Visual Analytics</i> group and of the <i>Cognitive VR Laboratory</i>, and one of the founding members of <i>IBM ThinkReality</i></p>
<p><i>Current</i> JAN 2018</p>	<p>Cofounder and Technical Lead at INSPAIRED, Singapore</p> <p>Project management and technical direction of Inspaired, a web-based startup focusing on private mentoring. Coordination of a small team of engineers.</p>
<p><i>Current</i> FEB 2014</p>	<p>Cofounder and Technical Lead at UNISHARE, Milan</p> <p>Direction of both frontend and backend development of the web and mobile platforms of Unishare, an Italian startup involving about 30 universities and more than 15,000 students in the country. Coordination of a small team of developers, with focus on modern technologies such as NODEJS, REACT and REACT NATIVE.</p>
<p>JAN-MAY 2016</p>	<p>Research Assistant at ELECTRONIC VISUALIZATION LABORATORY, Chicago</p> <p>Design of <i>hybrid reality systems</i> integrating different technologies such as virtual reality, augmented reality and mobile applications. Work on computer graphics, data visualization and human-computer interaction for immersive display systems (e.g. CAVE2, SAGE2). Development of the AR smartphone app currently in use by the <i>Chicago History Museum</i>.</p>

EDUCATION

<p>SEP 2016</p>	<p>Master of Engineering in COMPUTER ENGINEERING, Politecnico di Milano, Milan 110/110 <i>magna cum laude</i> Thesis: “Merging the Two Worlds: A Novel Approach to the Design of Mixed Reality Experiences” <i>Merit scholarship</i>, NECST LAB</p>
<p>MAY 2016</p>	<p>Master of Science in COMPUTER SCIENCE, University of Illinois, Chicago GPA: 4.0/4.0 <i>Merit scholarship</i>, CREATIVE CODING GROUP, ELECTRONIC VISUALIZATION LAB</p>
<p>FALL 2014</p>	<p>ATHENS Exchange program in IMAGE PROCESSING, Telecom ParisTech, Paris</p>
<p>SEP 2013</p>	<p>Bachelor of Engineering in COMPUTER ENGINEERING, Politecnico di Milano, Milan 100/100</p>

PUBLICATIONS AND RESEARCH

- 2018 | **CLUSTROPHILE 2: GUIDED VISUAL CLUSTERING ANALYSIS, IEEE Vis VAST**
By **M. Cavallo**, C. Demiralp | [Download paper](#)
- TRACK XPLOER: A SYSTEM FOR VISUAL ANALYSIS OF SENSOR-BASED MOTOR ACTIVITY PREDICTIONS, IEEE EUROVIS, IEEE VIS DSIA**
By **M. Cavallo**, C. Demiralp | [Download paper](#)
- A VISUAL INTERACTION FRAMEWORK FOR DIMENSIONALITY REDUCTION BASED DATA EXPLORATION, ACM CHI**
By **M. Cavallo**, C. Demiralp | [Download paper](#)
- HOLOBRAIN: AN EXTENDED REALITY SYSTEM TO ANALYZE BRAIN IMAGING DATA**
By **M. Cavallo**, P. Poloseki, S. Heisig | [See project](#)
- 2017 | **WANDERER: IMPROVING TIME-SERIES CLASSIFICATION PERFORMANCE THROUGH REAL-TIME VISUALIZATION OF SENSOR DATA, IEEE VIS VDS**
By **M. Cavallo**, C. Demiralp | [Download paper](#)
- EXPLORING DIMENSIONALITY REDUCTIONS WITH FORWARD AND BACKWARD PROJECTIONS, KDD IDEA**
By **M. Cavallo**, C. Demiralp | [Download paper](#)
- 2016 | **MERGING THE TWO WORLDS: A NOVEL APPROACH TO THE DESIGN OF MIXED REALITY EXPERIENCES (Thesis)**
By **M. Cavallo**, A. Forbes, P. Lanzi | [Download thesis](#)
- A VR REAL-TIME AUTHORING TOOL FOR DESIGNING AR EXPERIENCES**
By **M. Cavallo**, A. Forbes | [Download paper](#)
- EXPERIENCING THE HISTORY OF CHICAGO THROUGH AR, ISMAR**
By **M. Cavallo**, A. Forbes | [Download paper](#)
- A 3RD PERSON APPROACH TO VR BIOMECHANICAL REHABILITATION**
By **M. Cavallo**, A. Rottigni, E. Marai, J. Patton | [Download paper](#)
- DIGITAL QUEST: A MIXED REALITY APPROACH TO SCAVENGER HUNTS, IEEE VR MRA**
By **M. Cavallo**, A. Forbes | [Download paper](#)
- Virtual Maps: 3D City Reconstruction from Google Street View**
By **M. Cavallo** | [Download paper](#)

PATENTS

- 2018 | **VIRTUAL GENERATION OF LABELED MOTION SENSOR DATA FROM COMPUTER ANIMATIONS**
AUGMENTED REALITY SPEED READING
A COGNITIVE METHOD FOR FACIAL MIRRORING IN VIRTUAL AND AUGMENTED REALITY
- 2017 | **ENHANCED EXPLORATION OF DIMENSIONALLY REDUCED DATA**
FALL DETECTION IN VIRTUAL REALITY

Additional 16 invention disclosures are currently under review, among which: **PERSONALIZED INTERACTIVE DATA PRESENTATIONS THROUGH AUGMENTED REALITY, A METHOD FOR LOCOMOTION IN VIRTUAL REALITY DESK APPLICATIONS, FINE-GRAINED CONTROL OF AR APPLICATIONS THROUGH WEARABLES, A VISUAL TRACK ALGEBRA FOR EFFECTIVE ANALYSIS OF SENSOR DATA CLASSIFICATION OUTPUTS, RENDERING BRAIN ATLASES IN VIR-**

TUAL AND AUGMENTED REALITY USING HAND-COUPLED EXCLUSION CUBES, AD HOC EMERGENCY TRANSPARENT VIEW INTO PRIVATE WORKSPACES.

SELECTED PROJECTS

2018	HOLOPLOT: A CROSS-PLATFORM INTERACTIVE VISUALIZATION SYSTEM FOR DATA ANALYSIS By M. Cavallo	
	BUILDMYNET: A VISUAL COMPANION FOR CREATING AND TESTING ML PIPELINES By M. Cavallo	See project
	TESSERACT: COMPUTER GRAPHICS INTERACTION IN FOUR SPATIAL DIMENSIONS By M. Cavallo	See project
2017	VIRTUALYTICS: MIXED REALITY EXPLORATORY DATA ANALYSIS By M. Cavallo	See project
	IMPROVING REAL-LIFE MOTOR PERFORMANCE WITH VIRTUAL REALITY By A. Sipolins, M. Cavallo	See project
	BERNEN HOUSE: A 3D REAL-TIME INTERFACE FOR MONITORING IOT HOUSES By M. Cavallo , N. Hinds, J. Rogers	See project
	DECOMPOSITION OF COMPLEX MOVEMENTS INTO PRIMITIVES FOR PARKINSON'S DISEASE ASSESSMENT By E. Pissadaki, M. Cavallo et al.	Download paper
2016	BLUESKY BOOTH EXPERIENCE: REAL-TIME PARKINSON'S DISEASE ASSESSMENT By M. Cavallo , E. Bilal	See project
	TIMEFULNESS VR: VISUALIZING EEG DATA IN VIRTUAL REALITY By A. Sipolins, M. Cavallo	See project

INTERESTS AND ACTIVITIES

Photography, Film making, VFX, Design, 3D modeling, Robotics & Electronics, Videogame Programming, Team Sports, Teaching & Mentoring, World Exploration & Philanthropy.

Please refer to my website mastercava.com for more information about me.