

Irene VIOLA



PROFILE

I am a senior (tenured) researcher at Centrum Wiskunde & Informatica. My interests lay in multimedia compression, transmission and quality evaluation. My research is currently focused on Quality of Experience (QoE) metrics and methodologies for immersive multimedia systems (i.e., volumetric video for XR applications).

CONTACT DETAILS

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WORK EXPERIENCE

SENIOR RESEARCHER at *Centrum Wiskunde & Informatica (CWI)*
10.2020-pres.; tenured since 04.2024

- ◇ **GROUP** Distributed and Interactive Systems
- ◇ **RESEARCH INTERESTS** Compression, real-time optimization, and QoE for immersive media systems.

POST-DOC RESEARCHER at *Centrum Wiskunde & Informatica (CWI)*
08.2019–09.2020

- ◇ **GROUP** Distributed and Interactive Systems
- ◇ **RESEARCH INTERESTS** Metrics and methodologies to measure and predict the Quality of Experience (QoE) of immersive media representations, such as point clouds, in real-time multimedia systems.

POST-DOC RESEARCHER at *Ecole Polytechnique Federale de Lausanne (EPFL)*

05.2019–07.2019

- ◇ **GROUP** Multimedia Signal Processing Group
- ◇ **RESEARCH INTERESTS** Visual quality assessment and compression for light field and point cloud contents, and deep learning methods for image compression.

VISITING RESEARCHER at *Nagoya University*

06.2018–08.2018

- ◇ **SUPERVISOR** Prof. Toshiaki Fujii
- ◇ **RESEARCH INTERESTS** Evaluation of rendering-dependent compression solutions for light field displays.

DOCTORAL CANDIDATE at *Ecole Polytechnique Federale de Lausanne (EPFL)*

09.2015–04.2019

- ◇ **GROUP** Multimedia Signal Processing Group
- ◇ **RESEARCH INTERESTS** Light field compression and transmission, visual quality evaluation for immersive media.

EDUCATION

PHD IN ELECTRICAL AND ELECTRONIC ENGINEERING at *Ecole Polytechnique Federale de Lausanne (EPFL)*

2015–2019

- ◇ **ADVISOR** Prof. Touradj Ebrahimi
- ◇ **THESIS** Compression and visual quality assessment for light field contents
- ◇ The goal of the thesis is to provide an analysis of various methodologies for quality assessment of light field contents, to evaluate the compression capabilities of various encoding solutions, and to propose a new method to improve the coding efficiency for light field contents.

MSC IN COMPUTER ENGINEERING at *Polytechnic University of Turin*

2013–2015

- ◇ **ADVISORS** Prof. Martin Vetterli, Ecole Polytechnique Federale de Lausanne (EPFL), Prof. Enrico Magli, Polytechnic University of Turin
- ◇ **THESIS** A dataset for image super-resolution
- ◇ **GPA** 3.87/4.00
- ◇ **FINAL GRADE** 110/110

BSC IN CINEMA AND MEDIA ENGINEERING at *Polytechnic University of Turin*

2010–2013

- ◇ **GPA** 3.69/4.00
- ◇ **FINAL GRADE** 109/110

PROJECTS

AMPLIFY: PHYGITAL SOLUTIONS FOR THE CULTURAL AND CREATIVE INDUSTRIES (*Horizon Europe*)

11.2024–pres.

Co-PI

◇ AMPLIFY is a consortium of artists, technologists and researchers from 8 European countries dedicated to facilitating the digital transition in the Cultural and Creative Industries (CCIs). It rests on three ideas: a) Music is humanity's universal and transversal non-verbal language, enriching many CCI sectors; b) Physical– digital (phygital) experiences enrich the CCI offer with new opportunities; c) Impactful social value stems from co- creation by both professionals and non-professionals. AMPLIFY will develop, test and pilot two innovative suites of digital technologies empowered by AI and XR for CCIs.

OPEN-DASH-PC: OPEN-SOURCE ULL-DASH-PC FOR MULTI-PARTY REAL-TIME COMMUNICATION (*SPIRIT Open Calls*)

09.2024–pres.

PI

◇ Enabling real-time, multi-user, adaptive immersive communication is still an open challenge in the current research landscape, as currently used protocols for real-time immersive teleconferencing, such as WebRTC, require sophisticated algorithms in a central server to enable quality switching and offer poor scalability to multi-user scenarios. In our project OPEN-DASH-PC, we propose the use of Ultra Low Latency Dynamic Adaptive Streaming over HTTP for Point Cloud contents (ULL-DASH-PC), an open-source transport protocol that enables multi-quality, multi-user real-time communication using point cloud volumetric representation. OPEN-DASH-PC aims to make the component available to the SPIRIT platform and to the scientific community, to foster further development in the field.

INDUX-R: TRANSFORMING EUROPEAN INDUSTRIAL ECOSYSTEMS THROUGH EXTENDED REALITY ENHANCED WITH HUMAN-CENTRIC AI AND SECURE, 5G-ENABLED IOT (*Horizon Europe*)

01.2024–pres.

Co-PI

◇ INDUX-R envisions a human-centric XR ecosystem that will transform European industrial sectors by empowering humans and creating innovative XR products and services of significant added value. It targets concrete scientific breakthroughs focused on core XR technologies, namely, digitization and creation of XR assets, realistic animation, light-field HMDs, XR media streaming, and egocentric perception, delivered to multi-user applications through zero-touch 5G architecture and a secure, interoperable IoT network that can accommodate fluctuating demands and minimize waste of resources.

5DCULTURE: DEPLOYING AND DEMONSTRATING A 3D CULTURAL HERITAGE SPACE (*Digital Europe*)

09.2023–pres.

Co-PI

◇ 5Dculture enriches the offer of European 3D digital cultural heritage assets in the data space and fosters their reuse in important domains such as education, tourism and the wider cultural and creative sectors towards socially and economically sustainable outcomes.

TRANSMIXR: IGNITE THE IMMERSIVE MEDIA SECTOR BY ENABLING NEW NARRATIVE VISIONS (*Horizon Europe*)

10.2022–pres.

Co-PI

◇ The mission of TransMIXR is to introduce leading-edge technologies and experiences built around public values: to inform & entertain, to connect & inspire, to educate and empower. Its ambition is to strengthen the democratic mission and competitiveness of the European Cultural and Creative Sector with intelligent AI and XR technologies that are user-centric, transparent, trustworthy, inclusive, and accountable.

VOXREALITY: VOICE-DRIVEN INTERACTION IN XR SPACES (*Horizon Europe*)

10.2022–pres.

Co-PI

◇ VOXReality is an initiative that aims to facilitate the convergence of Natural Language Processing (NLP) and Computer Vision (CV) technologies in the Extended Reality (XR) field. The project will develop innovative models that will combine language as a core interaction medium supported by visual understanding to deliver next-generation applications that provide comprehension of users goals, surrounding environment and context.

USER-CENTERED OPTIMIZATION FOR IMMERSIVE MULTIMEDIA SYSTEMS (*NWO WISE Grant*)

09.2021–pres.

PI

◇ The project will focus on optimizing transmission and rendering of immersive media contents. In particular, the focus is on designing and integrating novel algorithms to improve compression and transmission efficiency of immersive media contents through Quality of Experience (QoE) optimization. We want to explore how to maximize the QoE for the user, while adhering to the technological constraints. Such optimization can be performed at the acquisition, transmission and rendering stage.

EUROPEAN NETWORK ON QUALITY OF EXPERIENCE IN MULTIMEDIA SYSTEMS AND SERVICES (QUALINET)

2017–pres.

Task Force Leader

◇ The goal of the task force Immersive Media Experiences (IMEx) is to identify use cases and application domains in the area of immersive media experiences, and to identify different QoE aspects in immersive experiences, developing new QoE models and QoE assessment approaches. The efforts culminated in a white paper on Definitions of Immersive Media Experiences. In 2022 and 2023, the Task Force has held workshops in Immersive eXtended Reality, co-located with the ACM International Conference on Multimedia.

VRTOGETHER: AN END-TO-END SYSTEM FOR THE PRODUCTION AND DELIVERY OF PHOTOREALISTIC SOCIAL IMMERSIVE VIRTUAL REALITY EXPERIENCES (*Horizon 2020*)

09.2019–11.2020

Scientist

◇ My role in the project was to develop Quality of Experience (QoE) metrics and evaluation methods to qualitatively assess the social VR experiences.

DIGITAL EYE: DEEP LEARNING VIDEO QUALITY ASSESSMENT TECHNOLOGY (*Swiss Commission For Technology And Innovation*)

03.2019–07.2019

Scientist

◇ My role in this project was to assist on quantization solutions for deep learning-based image compression, and to conduct subjective assessment of compression solutions based on crowdsourcing.

ADVANCED VISUAL REPRESENTATION AND CODING IN AUGMENTED AND VIRTUAL REALITY (*Swiss National Foundation for Scientific Research*)

03.2019–07.2019

Scientist

◇ My role on this project was on compression and visual quality assessment of volumetric media, with a focus on light field and point cloud representation.

LIVE: LIGHT FIELD IMAGE AND VIDEO CODING AND EVALUATION (*Swiss National Foundation for Scientific Research*)

03.2016–03.2019

Scientist

◇ My focus on this project was on immersive methodologies for subjective quality assessment of light field contents, particularly under coding artifacts, and on novel compression solutions for transmission and storage of light field images.

STANDARDIZATION

INTERNATIONAL TELECOMMUNICATION UNION (ITU) Study Group 12

2020–pres.

◇ Authored standards:

ITU-T P.919: Subjective test methodologies for 360° video on head-mounted displays

ITU-T P.1320: Quality of experience assessment of extended reality meetings

VIDEO QUALITY EXPERT GROUP (VQEG)

2019–pres.

◇ Participating in:

Immersive Media Group (IMG)

Statistical Analysis Methods (SAM)

MOTION PICTURE EXPERT GROUP (MPEG) AG5 - *MPEG Visual Quality Assessment 2019-pres.*

◇ Authored input documents:

WG11M54937: A reduced reference metric for visual quality evaluation of point cloud contents.

WG11M54398: Test Plan for Quality Assessment of 360-degree Video. Phase 1: Short sequences.

WG11M54451: Comparing the Quality of Highly Realistic Digital Humans in 3DoF and 6DoF: A Volumetric Video Case Study.

WG11M54936: A color-based objective quality metric for point cloud contents.

JOINT PHOTOGRAPHIC EXPERT GROUP (JPEG) *JPEG Pleno - Light Field*

2016–2019

◇ Authored input documents:

WG1M72022: Grand challenge on light field image compression

WG1M74023: Subjective Evaluation Methodology for JPEG Pleno CfP

WG1M75037: JPEG Pleno Anchor Evaluations EPFL

WG1M75073: JPEG Pleno Anchors subjective evaluation

WG1M76059: JPEG Pleno Overview of objective and subjective results for CfP on LF Coding

WG1M76070: JPEG Pleno CfP on LF - Overview

WG1M76071: JPEG Pleno CfP on LF - Subjective Evaluation EPFL

WG1M76072: JPEG Pleno CfP on LF - Objective Evaluation

WG1M76073: JPEG Pleno CfP on LF - Cross-correlation results

WG1M78025: JPEG-XS EPFL Subjective Test Results

WG1M78026: JPEG-XS EPFL Subjective Test Results Presentation

WG1M79042: JPEG Pleno LF CE3.2b Results - EPFL

WG1M84027: JPEG Pleno LF Coding Core Experiment 7.6 Report UFRJ-IME-UFF-IT-SRBR-EPFL

SCHOLARSHIP AND AWARDS

ACM MM BEST DEMO AWARD for *Mediascape XR: A Cultural Heritage Experience in Social VR*

2022

APSIPA SADAOKI FURUI PRIZE PAPER AWARD for *A comprehensive study of the rate-distortion performance in MPEG point cloud compression*

2020

MKS INSTRUMENTS RESEARCH EXCELLENCE AWARD

2017

EPFL EDIC FELLOWSHIP

2015

EUROPEAN INNOVATION ACADEMY (EIA), FULL SCHOLARSHIP

2015

ERASMUS+ AND SWISS-EUROPEAN MOBILITY PROGRAMME SCHOLARSHIP

2014

EDISU FULL UNIVERSITY SCHOLARSHIP

2010-2015

WINNER OF THE TRINITY COLLEGE LONDON OLYMPICS

2010

TEACHING

STUDENT SUPERVISION

2016–pres.

◇ **PHD STUDENTS** Xuemei Zhou (TU Delft, exp. 2025); Shishir Subramanyam (TU Delft, exp. 2024)

◇ **VISITING PHD STUDENTS** Silvia Rossi (University College London); Carlos Cortes (Universidad Politecnica de Madrid); Marouane Tliba (Université d'Orléans)

◇ **MSC STUDENTS** Karolina Wylezek (Utrecht University, 2024); Luca Becheanu (Utrecht University, 2024); Peter Huang (University of Amsterdam, 2024); Atanas Yonkov (University of Amsterdam, 2024); Gwennan Smitskamp (TU Delft, 2022); Nacho Reimat (Universitat Politècnica de Catalunya · Barcelona Tech, 2020); Baptiste Hériard-Dubreuil (Ecole Polytechnique Federale de Lausanne, 2019)

LECTURER

2017–2019

◇ I have served as a lecturer in the Image and Video Processing course, and in the QoE-Net summer school on QoE management and implementation, at the Ecole Polytechnique Federale de Lausanne.

TEACHING ASSISTANT

2013–2019

◇ I have been a teaching assistant and tutor for Calculus and Algebra courses for bachelor students at the Polytechnic University of Turin, and I have served as the responsible assistant on the courses Image and Video Processing and Media Security at the Ecole Polytechnique Federale de Lausanne.

TALKS

- ◇ Human-centered factors in immersive communication. Spring School on Social XR, Amsterdam, The Netherlands, March 4, 2024.
- ◇ Women+ @NWO, Amsterdam, The Netherlands, February 27, 2024.
- ◇ Human-centered factors in immersive communication. Colloquium Game and Media Technology, Utrecht, The Netherlands, December 4, 2023
- ◇ Human-centered factors in immersive communication. Dagstuhl seminar 23482 - Social XR: The Future of Communication and Collaboration, Dagstuhl, Germany, November 27, 2023
- ◇ Human-centered factors in immersive communication. Blekinge Institute of Technology, Karlshamn, Sweden, March 8, 2023
- ◇ Designing and Evaluating Experiences in (Social) XR. Blekinge Institute of Technology, Karlshamn, Sweden, March 7, 2023
- ◇ QoE for immersive communication, Dagstuhl Seminar 23042 - Quality of Sustainable Experience (QoSE), Dagstuhl, Germany, January 22-25, 2023
- ◇ Experiencing Cultural Heritage in Social VR. 3rd Joint ERCIM - JST Workshop. INRIA Rocquencourt, France, 2022
- ◇ Human-centric factors in immersive communication. Netherlands Organisation for Applied Scientific Research (TNO). The Hague, The Netherlands, 2022
- ◇ Quality of experience for immersive communication. CWI 75th anniversary celebration. Amsterdam, The Netherlands. 2021

OPEN SCIENCE

DATASETS

- ◇ ComPEQ-MR: Compressed Point Cloud Dataset with Eye Tracking and Quality Assessment in Mixed Reality (2024). Available here: <https://ftp.itec.aau.at/datasets/ComPEQ-MR/>
- ◇ QAVA-DPC: Eye-Tracking Based Quality Assessment and Visual Attention Dataset for Dynamic Point Cloud in 6 DoF (2023). Available here: https://github.com/cwi-dis/ISMAR_PointCloud_EyeTracking
- ◇ On the impact of VR assessment on the Quality of Experience of Highly Realistic Digital Humans (2022). Available here: <https://doi.org/10.5281/zenodo.5779209>

- ◇ CWIPC-SXR: Point Cloud dynamic human dataset for Social XR (2021). Available here: <https://www.dis.cwi.nl/cwipc-sxr-dataset/>
- ◇ 6 DoF head mounted display user navigation data for dynamic point cloud streaming (2020). Available here: <https://doi.org/10.5281/zenodo.5957282>
- ◇ M-PCCD: Quality assessment for point cloud compression (2019). Available here: <https://www.epfl.ch/labs/mmspg/downloads/quality-assessment-for-point-cloud-compression/>
- ◇ VALID: Visual quality Assessment for Light field Images Dataset (2018). Available here: <http://www.epfl.ch/labs/mmspg/VALID>

OPEN-SOURCE IMPLEMENTATIONS

- ◇ VR2Gather. Available here: <https://github.com/cwi-dis/VR2Gather>
- ◇ PointPCA suite. Available here: https://github.com/cwi-dis/pointpca_suite
- ◇ PCM_RR: A Reduced Reference Metric for Visual Quality Evaluation of Point Cloud Contents (2020). Available here: https://github.com/cwi-dis/PCM_RR
- ◇ A color-based objective quality metric for point cloud contents (2020). Available here: <https://github.com/cwi-dis/point-cloud-color-metric>
- ◇ Light field translation codec (2019). Available here: <https://github.com/mmspg/light-field-translation-codec>
- ◇ Light field tensor display simulator (2019). Available here: <https://github.com/mmspg/LFDisplaySimulator>
- ◇ Light field graph codec (2018). Available here: <https://github.com/mmspg/light-field-graph-codec>
- ◇ Testbed for interactive quality assessment of light field contents (2017). Available here: <https://github.com/mmspg/light-field-tracking>

PUBLICATIONS

BOOKS

- ◇ **Viola, I.**, and Cesar, P. (2022). Volumetric video streaming: Current approaches and implementations. In Valenzise, G., Alain, M., Zerman, E., and Ozcinar, C., *Immersive media technologies*. Elsevier.
- ◇ Alexiou, E., Nehme, Y., Zerman, E., **Viola, I.**, Lavoue, G., Ak, A., Smolic, A., Le Callet, P., and Cesar, P. (2022). Subjective and Objective Quality Assessment for Volumetric Video. In Valenzise, G., Alain, M., Zerman, E., and Ozcinar, C., *Immersive media technologies*. Elsevier.

JOURNALS

- ◇ Rossi, S., **Viola, I.**, Toni, L., and Cesar, P., 2024. A Clustering Approach to Unveil User Similarities in 6-DoF Extended Reality Applications. *ACM Transactions on Multimedia Computing, Communications and Applications*.
- ◇ Alexiou, E., Zhou, X., **Viola, I.**, and César, P., 2024. PointPCA: Point Cloud Objective Quality Assessment Using PCA-Based Descriptors. *EURASIP Journal on Image and Video Processing*.
- ◇ Cortés, C., **Viola, I.**, Gutiérrez, J., Jansen, J., Subramanyam, S., Alexiou, E., Pérez, P., García, N., and César, P., 2024. Delay threshold for social interaction in volumetric eXtended Reality communication. *ACM Transactions in Multimedia Computing, Communications, and Applications*, 20, 7, Article 206 (July 2024), 22 pages.
- ◇ Lee, S., **Viola, I.**, Rossi, S., Guo, Z., Reimat, I., Lawicka, K., Striner, A., and Cesar, P., 2024. Designing and Evaluating a VR Lobby for a Socially Enriching Remote Opera Watching Experience. *IEEE Transactions on Visualization and Computer Graphics*, vol. 30, no. 05, pp. 2055-2065.
- ◇ **Viola, I.**, Jansen, J., Subramanyam, S., Reimat, I., and Cesar, P., 2023. VR2Gather: A collaborative social VR system for adaptive multi-party real-time communication. *IEEE MultiMedia*, vol. 30, no. 2, pp. 48-59.

- ◇ **Viola, I.**, Subramanyam, S., Li, J. and Cesar, P., 2022. On the impact of VR assessment on the Quality of Experience of Highly Realistic Digital Humans. *Quality and User Experience*, 7(1), pp.1-32.
- ◇ Gutierrez, J., Perez, P., Orduna, M., Singla, A., Cortes, C., Mazumdar, P., **Viola, I.**, Brunnstrom, K., Battisti, F., Cieplinska, N. and Juszka, D., 2022. Subjective Evaluation of Visual Quality and Simulator Sickness of Short 360 degrees Videos: ITU-T Rec. P. 919. *IEEE Transactions on Multimedia*, 24, pp.3087-3100.
- ◇ **Viola, I.**, and Cesar, P., 2020. A reduced reference metric for visual quality evaluation of point cloud contents. *IEEE Signal Processing Letters*, 27, pp.1660-1664.
- ◇ Alexiou, E., **Viola, I.**, Borges, T.M., Fonseca, T.A., de Queiroz, R.L. and Ebrahimi, T., 2019. A comprehensive study of the rate-distortion performance in MPEG point cloud compression. *APSIPA Transactions on Signal and Information Processing*, 8. [2020 Sadaoki Furui Prize Paper Award]
- ◇ **Viola, I.**, Řeřábek, M. and Ebrahimi, T., 2017. Comparison and evaluation of light field image coding approaches. *IEEE Journal of Selected Topics in Signal Processing*, 11(7), pp.1092-1106.

MAIN CONFERENCE PROCEEDINGS

- ◇ Zhou, X., **Viola, I.**, Chen, Y., Pei, J., and Cesar, P. 2024, October. Deciphering Perceptual Quality in Colored Point Cloud: Prioritizing Geometry or Texture Distortion? In *Proceedings of the 32nd ACM International Conference on Multimedia (MM'24)*. Association for Computing Machinery, New York, NY, USA.
- ◇ Pei, J., **Viola, I.**, Huang, H., Wang, J., Ahsan, M., Ye, F., Yiming, J., Sai, Y., Wang, D., Chen, Z., Ren, P., and Cesar, P. 2024, August. Autonomous Workflow for Multimodal Fine-Grained Training Assistants Towards Mixed Reality. In *The 62nd Annual Meeting of the Association for Computational Linguistics (ACL 2024)*.
- ◇ Lee, S., **Viola, I.**, Singla, A., and Cesar, P., 2024, June. Communication Challenges between Clients and Producers of Immersive Media Applications: can Social XR help? In *Proceedings of the 2024 ACM International Conference on Interactive Media Experiences (IMX '24)*. Association for Computing Machinery, New York, NY, USA.
- ◇ Tliba, M., Zhou, X., **Viola, I.**, Cesar, P., Chetouani, A., Valenzise, G., and Dufaux, F., 2024, June. Enhancing Immersive Experiences through 3D Point Cloud Analysis: A Novel Framework for Applying 2D Visual Saliency Models to 3D Point Clouds. In *2024 Sixteenth International Conference on Quality of Multimedia Experience (QoMEX)* (pp. 1-6). IEEE.
- ◇ Zhou, X., **Viola, I.**, Alexiou, E., Jansen, J., and Cesar, P., 2023, October. QAVA-DPC: Eye-Tracking Based Quality Assessment and Visual Attention Dataset for Dynamic Point Cloud in 6 DoF. In *Proceedings of the IEEE International Symposium on Mixed and Augmented Reality (ISMAR)*. IEEE.
- ◇ Zhou, X., Alexiou, E., **Viola, I.**, and Cesar, P., 2023, October. PointPCA+: Extending PointPCA objective quality assessment metric. In *2023 IEEE International Conference on Image Processing (ICIP)*. IEEE.
- ◇ Rossi, S., **Viola, I.**, Toni, L., and Cesar, P. 2023, June. Extending 3-DoF Metrics to Model User Behaviour Similarity in 6-DoF Immersive Applications. In *Proceedings of the 14th ACM Multimedia Systems Conference (MMSys '23)*. Association for Computing Machinery, New York, NY, USA.
- ◇ Smitskamp, S., **Viola, I.**, and Cesar, P. 2023, June. Evaluation of point cloud features for no-reference visual quality assessment. In *2023 Fifteenth International Conference on Quality of Multimedia Experience (QoMEX)* (pp. 1-6). IEEE.
- ◇ Subramanyam, S., **Viola, I.**, Jansen, J., Alexiou, E., Hanjalic, A. and Cesar, P., 2022, October. Evaluating the Impact of Tiled User-Adaptive Real-Time Point Cloud Streaming on VR Remote Communication. In *Proceedings of the 30th ACM international conference on Multimedia (MM '22)*. Association for Computing Machinery, New York, NY, USA.
- ◇ Cortés, C., Gutiérrez, J., Pérez, P., **Viola, I.**, Cesar, P., and García, N. 2022, October. Impact of self-view latency on Quality of Experience: analysis of natural interaction in XR environments. In *2022 IEEE International Conference on Image Processing (ICIP)*. IEEE.

- ◇ Subramanyam, S., **Viola, I.**, Jansen, J., Alexiou, E., Hanjalic, A., and Cesar, P. 2022, September. Subjective QoE Evaluation of User-Centered Adaptive Streaming of Dynamic Point Clouds. In *2022 Fourteenth International Conference on Quality of Multimedia Experience (QoMEX)* (pp. 1-6). IEEE.
- ◇ Xue, T., El Ali, A., **Viola, I.**, Ding, G., and Cesar, P. 2022, September. Designing Real-time, Continuous QoE Score Acquisition Techniques for HMD-based 360 VR Video Watching. In *2022 Fourteenth International Conference on Quality of Multimedia Experience (QoMEX)* (pp. 1-6). IEEE.
- ◇ Rossi, S., **Viola, I.**, Toni, L., and Cesar, P. 2021, October. A new Challenge: Behavioural analysis of 6-DoF user when consuming immersive media. In *2021 IEEE International Conference on Image Processing (ICIP)*. IEEE.
- ◇ Subramanyam, S., **Viola, I.**, Hanjalic, A. and Cesar, P., 2020, October. User-centered Adaptive Streaming of Dynamic Point Clouds with Low Complexity Tiling. In *Proceedings of the 28th ACM international conference on Multimedia (MM '20)*. Association for Computing Machinery, New York, NY, USA.
- ◇ Subramanyam, S., Li, J., **Viola, I.** and Cesar, P., 2020, March. Comparing the quality of highly realistic digital humans in 3DoF and 6DoF: A volumetric video case study. In *2020 IEEE Conference on Virtual Reality and 3D User Interfaces (VR)* (pp. 127-136). IEEE.
- ◇ **Viola, I.**, Mulder, J., Simone, F. and Cesar, P., 2019, December. Temporal Interpolation of Dynamic Digital Humans using Convolutional Neural Networks. In *2019 IEEE International Conference on Artificial Intelligence and Virtual Reality (AIVR)* (pp. 90-907). IEEE.
- ◇ Hériard-Dubreuil, B., **Viola, I.** and Ebrahimi, T., 2019, November. Light field compression using translation-assisted view estimation. In *2019 Picture Coding Symposium (PCS)* (pp. 1-5). IEEE.
- ◇ **Viola, I.**, Takahashi, K., Fujii, T. and Ebrahimi, T., 2019, September. Rendering-dependent compression and quality evaluation for light field contents. In *Applications of Digital Image Processing XLII* (Vol. 11137, p. 1113711). International Society for Optics and Photonics.
- ◇ **Viola, I.** and Ebrahimi, T., 2019, June. An in-depth analysis of single-image subjective quality assessment of light field contents. In *2019 Eleventh International Conference on Quality of Multimedia Experience (QoMEX)* (pp. 1-6). IEEE.
- ◇ **Viola, I.**, Takahashi, K., Fujii, T. and Ebrahimi, T., 2019, January. A comprehensive framework for visual quality assessment of light field tensor displays. *Electronic Imaging, 2019(10)*, pp.310-1.
- ◇ **Viola, I.**, Maretic, H.P., Frossard, P. and Ebrahimi, T., 2018, September. A graph learning approach for light field image compression. In *Applications of Digital Image Processing XLI* (Vol. 10752, p. 107520E). International Society for Optics and Photonics.
- ◇ Willème, A., Mahmoudpour, S., **Viola, I.**, Fliegel, K., Pospíšil, J., Ebrahimi, T., Schelkens, P., Descampe, A. and Macq, B., 2018, September. Overview of the JPEG XS core coding system subjective evaluations. In *Applications of Digital Image Processing XLI* (Vol. 10752, p. 107521M). International Society for Optics and Photonics.
- ◇ Upenik, E., **Viola, I.** and Ebrahimi, T., 2018, September. A rendering solution to display light field in virtual reality. In *2018 26th European Signal Processing Conference (EUSIPCO)* (pp. 246-250). IEEE.
- ◇ **Viola, I.** and Ebrahimi, T., 2018, September. Comparison of Interactive Subjective Methodologies for Light Field Quality Evaluation. In *2018 26th European Signal Processing Conference (EUSIPCO)* (pp. 1865-1869). IEEE.
- ◇ **Viola, I.** and Ebrahimi, T., 2017, September. A new framework for interactive quality assessment with application to light field coding. In *Applications of Digital Image Processing XL* (Vol. 10396, p. 103961F). International Society for Optics and Photonics.
- ◇ **Viola, I.**, Řeřábek, M. and Ebrahimi, T., 2017, May. Impact of interactivity on the assessment of quality of experience for light field content. In *2017 Ninth International Conference on Quality of Multimedia Experience (QoMEX)* (pp. 1-6). IEEE.

- ◇ **Viola, I.**, Řeřábek, M., Bruylants, T., Schelkens, P., Pereira, F. and Ebrahimi, T., 2016, December. Objective and subjective evaluation of light field image compression algorithms. In *2016 Picture Coding Symposium (PCS)* (pp. 1-5). IEEE.
- ◇ **Viola, I.**, Řeřábek, M. and Ebrahimi, T., 2016, September. A new approach to subjectively assess quality of plenoptic content. In *Applications of Digital Image Processing XXXIX* (Vol. 9971, p. 99710X). International Society for Optics and Photonics.

ADJUNCT CONFERENCE PROCEEDINGS

- ◇ Jansen, J., Röggl, T., Rossi, S., **Viola, I.**, and Cesar, P., 2024, October. Open-Sourcing VR2Gather: A Collaborative Social VR System for Adaptive Multi-Party Real Time Communication. In *Proceedings of ACM International Conference on Multimedia (ACM MM'24)*. Association for Computing Machinery, New York, NY, USA. (open source competition)
- ◇ Nguyen, M., Vats, S., Zhou, X., **Viola, I.**, Cesar, P., Timmerer, C., and Hellwagner, H., 2024, April. ComPEQ-MR: Compressed Point Cloud Dataset with Eye Tracking and Quality Assessment in Mixed Reality. In *ACM Multimedia Systems Conference 2024 (MMSys '24)*. Association for Computing Machinery, New York, NY, USA.
- ◇ Röggl, T., Shamma, D. A., Williamson, J. R., **Viola, I.**, Rossi, S., and Cesar, P., 2024, April. A Platform for Collecting User Behaviour Data during Social VR Experiments Using Mozilla Hubs. In *16th International Workshop on Immersive Mixed and Virtual Environment Systems (MMVE '24)*. Association for Computing Machinery, New York, NY, USA.
- ◇ **Viola, I.**, Amirpour, H., Arévalo Arboleda, S., and Torres Vega, M., 2023, October. IXR '23: 2nd International Workshop on Interactive eXtended Reality. In *Proceedings of ACM International Conference on Multimedia (ACM MM'23)*. Association for Computing Machinery, New York, NY, USA. (workshop)
- ◇ **Viola, I.**, and Torres Vega, M., 2023, October. On the Impact of Interactive eXtended Reality: Challenges and Opportunities for Multimedia Research. In *Proceedings of ACM International Conference on Multimedia (ACM MM'23)*. Association for Computing Machinery, New York, NY, USA. (panel)
- ◇ Singla, A., Wang, S., Göring, S., Rao, R.R.R., **Viola, I.**, Cesar, P., and Raake, A., 2023, October. Subjective Quality Evaluation of Point Clouds using Remote Testing. In *Proceedings of the 2nd International Workshop on Interactive eXtended Reality (IXR '23)*. Association for Computing Machinery, New York, NY, USA.
- ◇ Reimat, I., Mei, Y., Alexiou, E., Jansen, J., Li, J., Subramanyam, S., **Viola, I.**, Oomen, J., and Cesar, P., 2022, October. Mediascape XR: A cultural heritage experience in Social VR. In *Proceedings of the 30th ACM international conference on Multimedia (MM '22)*. Association for Computing Machinery, New York, NY, USA. **[Best demo award]**
- ◇ **Viola, I.**, Amirpour, H., and Torres Vega, M., 2022, October. IXR '22: 1st International Workshop on Interactive eXtended Reality. In *Proceedings of ACM International Conference on Multimedia (ACM MM'22)*. Association for Computing Machinery, New York, NY, USA. (workshop)
- ◇ Rossi, S., **Viola, I.**, and Cesar, P., 2022, October. Behavioural Analysis in a 6-DoF VR System: Influence of Content, Quality and User Disposition. In *Proceedings of the 1st Workshop on Interactive eXtended Reality (IXR '22)*. Association for Computing Machinery, New York, NY, USA.
- ◇ Rossi, S., **Viola, I.**, Jansen, J., Subramanyam, S., Toni, L., and Cesar, P., 2021. Influence of Narrative Elements on User Behaviour in Photorealistic Social VR. In *Proceedings of the International Workshop on Immersive Mixed and Virtual Environment Systems (MMVE '21)*. Association for Computing Machinery, New York, NY, USA.
- ◇ Reimat, I., Alexiou, E., Jansen, J., **Viola, I.**, Subramanyam, S., and Cesar, P., 2021. CWIPC-SXR: Point Cloud dynamic human dataset for Social XR. In *Proceedings of the 12th ACM Multimedia Systems Conference (MMSys '21)* (pp. 300-306).
- ◇ **Viola, I.** and Ebrahimi, T., 2018, July. Quality assessment of compression solutions for ICIP 2017 Grand Challenge on light field image coding. In *2018 IEEE International Conference on Multimedia & Expo Workshops (ICMEW)* (pp. 1-6). IEEE.

◇ **Viola, I.** and Ebrahimi, T., 2018, May. VALID: Visual quality assessment for light field images dataset. In 2018 Tenth International Conference on Quality of Multimedia Experience (QoMEX) (pp. 1-3). IEEE.

PROCEEDINGS

◇ Rostami, A., McMillan, D., Hook, J., **Viola, I.**, Nishida, J., Teja Maddali, H., and Clay, A. (eds.) (2024). Proceedings of the 2024 ACM International Conference on Interactive Media Experiences (IMX'24). Association for Computing Machinery, New York, NY, USA.

◇ **Viola, I.**, Amirpour, H., Arévalo Arboleda, S., and Torres Vega, M. (eds.) (2023). Proceedings of the 2nd Workshop on Interactive eXtended Reality (IXR '23). Association for Computing Machinery, New York, NY, USA.

◇ Torres Vega, M., De Moor, K., Farias, M., Fiedler, M., **Viola, I.**, and Van Wallendael, G. (eds.) (2023). Proceedings of the 15th International Conference on Quality of Multimedia Experience (QoMEX), 2023.

◇ Christie, M., **Viola, I.**, and Zerman, E. (eds) (2023). Proceedings of the International Conference on Immersive Media eXperiences Workshops (ACM IMXw). Association for Computing Machinery, New York, NY, USA.

◇ **Viola, I.**, Amirpour, H., and Torres Vega, M. (eds.) (2022). Proceedings of the 1st Workshop on Interactive eXtended Reality (IXR '22). Association for Computing Machinery, New York, NY, USA.

◇ Murray, N., Simon, G., Farias, **Viola, I.**, and Montagud, M. (eds.) (2022). Proceedings of the 13th ACM Multimedia Systems Conference. Association for Computing Machinery, New York, NY, USA.

◇ Montagud, M., D'Acunto, L., and **Viola, I.** (eds.) (2021). Proceedings of the International Workshop on Immersive Mixed and Virtual Environment Systems (MMVE '21). Association for Computing Machinery, New York, NY, USA.

ACADEMIC SERVICE

CO-ORGANISER

◇ 1st International Workshop on Measuring and Modelling User Experiences in XR. Co-located with ACM International Conference on Interactive Media Experiences (IMX'24) and 16th International Conference on Quality of Multimedia Experience (QoMEX). June 17, 2024.

◇ 2nd Spring School on Social XR, March 4-8, 2024.

◇ 2nd International Workshop on Interactive eXtended Reality (IXR'23). Co-located with ACM International Conference on Multimedia, October 29, 2023.

◇ 1st Spring School on Social XR, March 13-17, 2023.

◇ 1st International Workshop on Interactive eXtended Reality (IXR'22). Co-located with ACM International Conference on Multimedia, October 14, 2022.

TECHNICAL PROGRAM CHAIR

◇ ACM International Conference on Interactive Media Experiences (IMX'24). June 14-16, 2024. Stockholm, Sweden.

◇ 15th International Conference on Quality of Multimedia Experience (QoMEX). June 20-22, 2023. Ghent, Belgium.

◇ 13th ACM International Conference on Multimedia Systems (MMSys'22). June 14-17, 2022. Athlone, Ireland.

◇ 13th ACM International Workshop on Immersive Mixed and Virtual Environment systems (MMVE'21). September 28 - October 1, 2021. Istanbul, Turkey.

ORGANIZING COMMITTEE

◇ Proceedings Chair, ACM International Conference on Multimedia (MM'26). 2026. Newark, New Jersey.

- ◇ Publicity Chair, IEEE International Conference on Multimedia & Expo (ICME). 2025. Nantes, France.
- ◇ Demo Chair, 16th International Conference on Quality of Multimedia Experience (QoMEX). June 17-20, 2024. Karlsham, Sweden.
- ◇ Workshop Chair, ACM International Conference on Interactive Media Experiences (IMX'23). June 12-15, 2023. Nantes, France.

ASSOCIATE CHAIR AND TECHNICAL PROGRAM COMMITTEE

- ◇ 32nd ACM International Conference on Multimedia (MM'24). October 28-November 1, 2024. Melbourne, Australia.
- ◇ 1st IEEE ICME Workshop on Surpassing Latency Limits in Adaptive Live Video Streaming (LIVES'24)
- ◇ 34th International Workshop on Network and Operating System Support for Digital Audio and Video (NOSSDAV'24)
- ◇ 16th International Workshop on Immersive Mixed and Virtual Environment Systems (MMVE'24)
- ◇ 15th ACM Multimedia Systems Conference (MMSys'24) - Research and Open-source Software and Datasets tracks
- ◇ 31st ACM International Conference on Multimedia (MM'23). October 29-November 2, 2023. Ottawa, Canada.
- ◇ 15th International Workshop on Immersive Mixed and Virtual Environment Systems (MMVE'23)
- ◇ 14th ACM Multimedia Systems Conference (MMSys'23) - Research and Open-source Software and Datasets tracks
- ◇ 30th ACM International Conference on Multimedia (MM'22). October 10-14, 2022. Lisbon, Portugal.
- ◇ ACM International Conference on Interactive Media Experiences (IMX'22). June 22-24, 2022. Aveiro, Portugal.
- ◇ 29th ACM International Conference on Multimedia (MM'21). October 20-24, 2021. Chengdu, China.

ASSOCIATE EDITOR

- ◇ Quality and User Experience, Springer.

GUEST EDITOR

- ◇ Advances on Point Cloud technology: From coding and quality evaluation to applications. In: EURASIP Journal on Image and Video Processing, 2024.
- ◇ Challenges in Image Processing for Extended Reality. In: Frontiers in Signal Processing, 2022.
- ◇ Enabling New Horizons for Multimedia Systems (Selected Papers from ACM MMSys'22). In: ACM Transactions on Multimedia Computing, Communications, and Applications, 2024.

REVIEWER

- ◇ IEEE Transactions on Image Processing, IEEE Transactions on Multimedia, IEEE Journal of Emerging and Selected Topics in Circuits and Systems, IEEE Signal Processing Letters, IEEE Transactions on Circuits and Systems for Video Technology, ACM Transactions on Multimedia Computing, Communications, and Applications, IEEE Transactions on Circuits and Systems II: Express Briefs, IEEE MultiMedia, EURASIP Journal on Image and Video Processing, ACM International Conference on Multimedia (ACM MM), International Conference on Multimedia and Expo (ICME), International Conference on Image Processing (ICIP), Data Compression Conference (DCC), International Conference on Quality of Multimedia Experience (QoMEX), Picture Coding Symposium (PCC), International Conference on Interactive Media Experiences (IMX), ACM International Conference on Multimedia Systems (MMSys), International Workshop on Immersive Mixed and Virtual Environment systems (MMVE), International Workshop on Network and Operating System Support for Digital Audio and Video (NOSSDAV).

OTHER

SKILLS

- ◇ Programming Languages: MATLAB, Python, Java, Bash, Javascript, C/C++, HTML/CSS
- ◇ Software: FFMpeg, Blender, LaTeX, Git, Adobe Photoshop, Adobe Illustrator
- ◇ Operating Systems: Linux, MacOS, Windows

LANGUAGES

- ◇ Full working proficiency: English (C2)
- ◇ Intermediate proficiency: Greek (B2)
- ◇ Elementary proficiency: French (A2), Dutch (A1)
- ◇ Native proficiency: Italian

MISCELLANEOUS

- ◇ Amateur subtitles translator (tv comedies are my favourite!)
- ◇ Radio host for OndeQuadre's popular university radio program Zapping! (2014)
- ◇ Graphic advisor for the Italian Red Cross
- ◇ Co-organiser of a convention on web writing, sponsored by Rome Municipality III