Andrea **Giachetti** – Curriculum Vitae

Personal information

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Position

11/2023-	**Full Professor, Department of Engineering for Innovation Medicine University of Verona** SSD **IINF-05/A**
2007-2023	Associate Professor, Department of Computer Science University of Verona SSD ING-INF05
2019 – present	Associate Researcher – CNR IMATI, Genova

Work Experience

2015-2022	**President** of the **Italian chapter of the Eurographics association** (www.eg-italy.org - the association brings together all the main Italian computer graphics research groups and organizes the annual conference, schools and other activities)
2013 -2020	President of **Circolo di Trento di Legambiente** (www.legambientetrento.it)
2004 - 2010	Scientific consultant at **Centro di Ricerca, Sviluppo e Studi Superiori in Sardegna (CRS4)** working on several EU-funded research projects
2004-2006	Assistant professor in the department of Computer Science of the University of Cagliari.
2002-2004	Head of the **"Image processing and physical simulation"** group in the Biomedical Application Area of CRS4 coordinating a group of 4 people, being key staff of various EU funded projects.
1999-2001	Expert researcher at CRS4
1997-1999	Researcher at CRS4
11/96-1/97	Consultant at CNR-ICB, Genova, working on texture analysis
11-96	Teaching activity in High schools
7/96	Scientific consultant at CRS4 Cagliari.
4/93-9/93	Elsag-Bailey research fellowship

Education and qualifications

2017	**Qualification as full professor 09/H1 Sistemi di Elaborazione delle Informazioni**
2000	Qualification as Mathematics and Physics teacher for the Secondary School in Italy (exam held in Bolzano/Bozen).
2000	Professional course on Imaging in Radiology and RIS-PACS integration.
1997	**Ph. D. in Physics** from the University of Genova, Italy. Thesis:

"Ricostruzione del moto da sequenze di immagini", supervisor prof. Vincent Torre, topic: Computer Vision

1993   **Master Degree in Physics** from the University of Genova, Italy (110/110 cum laude)

Teaching

Current courses

- Interazione Persona-Macchina, Laurea triennale in Ingegneria dei sistemi robotici e intelligenti
- Advanced Visual Computing, Masters' degree in Computer Engineering for Intelligent Systems
- Extended reality and Advanced Interaction Masters' degree in Computer Engineering for Intelligent Systems

Past courses

"Human-Computer interaction/Intellligent interfaces" of the Masters' degree in Computer Engineering for Robotics and smart industry ad the Masters' degree in Artificial Intelligence.

"Computer Graphics" of the bachelor degree in Computer Science.

"Fundamentals of Computer Graphics" for the Master in Computer Game Development.

Data Visualization Masters' degree in Computer Engineering for Ro botics and smart industry .

Digital Design Masters' degree in Computer Engineering for Robotics and smart industry .

"Image and volume data analysis", master's degree in engineering and computer science

Ph.D. course on "Medial representations for 3D shape analysis".

Elaborazione Immagini in Medicina/Elaborazione dati Biomedici

Elaborazione Immagini in Medicina (5 cfu) Laurea in Sistemi Intelligenti e Multimediali

Tecnologie Informatiche e Multimediali (6cfu) Bachelor degree, Faculty of Education, University of Verona.

Informatica 2 (4 cfu) Master degree, Faculty of Education, University of Verona.

Fondamenti di Informatica (8- cfu) Bachelor degree, Faculty of Education, University of Verona.

Elaborazione Immagini e Visione Computazionale Master degree in Computer Science, University of Cagliari (6 cfu).

Laboratorio di Programmazione (6 cfu) e Programmazione Orientata agli Oggetti Bachelor degree in Computer Science, University of Cagliari (6 cfu).

Laboratorio di Programmazione (6 cfu) Bachelor degree in Computer Science, University of Cagliari (6 cfu).

Laboratorio IV (Sistemi Operativi) bachelor degree in Computer Science, University of Cagliari (3 cfu).

"Fondamenti di Informatica" bachelor degree in Earth Sciences, University of Cagliari (6 cfu).

Other teaching activities/international teaching

- Lecture on **AI-based gestural interaction for immersive VR applications: algorithms and challenges** in the Winter PhD school **Modern Computer Graphics: AI Techniques for 3D Reconstruction, Rendering, and Analysis** November 11-13, 2024 Verona, Italy
- **Organization** of the Summer School **International School on Graphics and Geometry Processing for Digital Manufacturing** Brescia Oct. 26-18, 2018
- Lecture on **Shape, appearance and relighting from multi-Light image collections** within the tutorial "**Methods for photographic radiometry, modeling of light transport and material appearance**", International Conference on 3D Vision, 3DV 2018, Verona, 5-8/9 2018
- **Organization** and **teaching** in the "**First Summer School of the EU Project 3D anatomical human**" Pula (CA, Italy), May 2008.
- Lecture in the tutorial "**Towards the virtual physiological human**" at the Eurographics 2007 conference, Prague. https://diglib.eg.org/handle/10.2312/egt.20071062.125-172

Students' supervision

Supervision of Ph.D. Activity of the following students: **Shakir Ullah** (2024-) , **Deborah Pintani** (2023-) **Leonardo Righetto** (2022,-), **Marco Emporio** (2021-), **Filippo Andrea Fanni** (2019-2022), **Tinsae Gebrechristos Dulecha** (2018-2021), **Ariel Caputo** (2015-2018).

With prof. Carlo Zancanaro, co-supervisor the Ph.D. thesis of **Christian Lovato** (Multimodal imaging in medicine, 2013). With prof. Daniele.Giusto, co-tutor of the Ph.D activity of **Barbara Podda** at the University of Cagliari.

Supervisor of **>20** Master theses in Computer Science and **> 50** bachelor theses in Computer Science at UNIVR, as well as 3 bachelor and 2 Master theses at the faculty of Education.

Supervision of postdoc/postgraduate researchers

Marco Emporio (2025/26), Tinsae Gebrechristos Dulecha (2024/5), Filippo Andrea Fanni (2023), Alvise Vivenza (2022), Ariel Caputo (2018-2022), Irina Ciortan (2018-2021), Marco Pesavento (2019), Marco Romagnoli (2015), Valeria Garro (2013,14), Christian Lovato 2013(14)

Supervision of internships

I supervised **more than 100** undergrad internships for the degree of Computer Science/Bioinformatica as company tutor ("tutor aziendale") and academic tutor at the University of Verona organizing activities for them in the VIPS and INTELLIGO-GRAIL labs.

External reviewing of PhD theses

I have been **external reviewer for 7 PhD theses** (Stefano Marras, Fabio Guggeri, University of Cagliari, Luca Cosmo, University of Venice, Imon Banerjee, University of Genoa, Francesco Di Renzo, University of Rome-La Sapienza), Yuly Castro (University of Burgundy, France), Omar Ikne, University of Lille.

I have been also component of an external reviewers commission for a final Ph.D. defense at the University of Brescia (Computer Engineering XXX ciclo, 2018)

External competition commissions

Component of commission for Ricercatore a tempo determinato di tipo A, DIBRIS, Univ. Genova, 2017 and for competition 367.329 TEC IMATI (2023)

University assignments

- Current:
  - ◦ **Programme Director** of the **Masters' degree in Computer Engineering for Robotics and Smart Industry**
  - ◦ Chair, QA Commission Master's degree in Computer Engineering for Robotics and Smart Industry – LM32
  - ◦ member, PhD Committee - Department Computer Science
  - ◦ member, Computer Science Teaching Committee - Department Computer Science
  - ◦ member Teaching College of Mathematics and Data Science - Department Computer Science
  - ◦ member Human Centered Medical System Engineering Teaching Committee - Department Department of Engineering for Innovation Medicine
  - ◦ member Scientific Committee of the Master in Computer game development - Department Computer Science
  - ◦ member Council of the Department of Engineering for Innovation Medicine - Department Department of Engineering for Innovation Medicine
- **Past roles:** Member of joint commission, Scuola di Scienze e Ingegneria, member of the Department Board of the department Computer Science of UNIVR. President of the spinoff commission of the department of Computer Science, contact person for Quality Evaluation (AVA) for the Master Degree in Engineering and Computer Science, and in the commission for the evaluation of applications for teaching contracts.

Research projects' management and contributions

- Current
  - ◦ **ICETeachXR:** Open Call 2 Master-XR project: EU-funded project for using VR digital twon

for learning tasks in robotics (competitive grant, funding 100.000 Euro)

- ◦ PRIN 2022: REFLEX – REFLectance EXploration: improving the acquisition, distribution, and exploration of multi-light image collections for surface characterization and analysis, **proect coordinator, (competitive grant, funding 224,685 Euro)**
- ◦ Interconnected North-Est Innovation Ecosystem (iNEST), funded by the European Union Next-GenerationEU (Piano Nazionale di Ripresa e Resilienza (PNRR) – Missione 4 Componente 2, Investimento 1.5 – D.D.~1058 23/06/2022, ECS00000043). Spoke 5, RT4 Personalized Assistive Technologies and Smart Environments for Inclusive Living in private and public spaces **Task leader Task S4_RT4.3 Task S4_RT4.4**, contribution to **RT2 Digital Twin in Industries 5.0**

- • Past
  - ◦ **2018-2023** Project Manager Tecnologia Abilitanti 2. Augmented Reality, Additive manufacturing, **Progetto di Eccellenza Dipartimento di Informatica - Computer Engineering for Industry 4.0**
  - ◦ **2020-2023 Hybrid Sustainable Worlds (**POR FESR 2014-2020, azione 1.1.4 DGR 822/2020, **local coordinator, local funding 120000 Euro**
  - ◦ **2021**– Principal investigator, **Prima Industries** - AI solutions for laser cutting machine industrial contract, funding: **38000 Euro**
  - ◦ **2018-2021 PRIN2015** project **DSurf:** Scalable Computational methods for 3D printing surfaces, local unit coordinator, (competitive grant, MUR, local funding **72736** Euro)
  - ◦ **Unit leader** (with Claudia Daffara) of the Verona unit of the **Horizon 2020** project **Scan4Reco** Grant Agreement No: 665091 [H2020-REFLECTIVE-7-2014] Advanced 3D modelling for accessing and understanding European cultural assets (competitive grant, local funding **379000** Euro)
  - ◦ **2020 Principal Investigator** Industrial contract with **TR2 Srls** Supporto scientifico per sviluppo algoritmi di A.I. local funding **7000 euro**)
  - ◦ **2019** Royal Society of Edinburgh & CNR (Italy). Cultural Heritage: **Modelling the challenge to visitor flow in specific historic buildings – 3000 euro (with CNR - IMATI)**
  - ◦ **2019** Industrial contract The Edge Company) Analysis and development of gestural interaction methods for Augmented Reality applications local funding **30000** Euro.
  - ◦ **2014** - Principal Investigator project **"Analisi e codifica compatta di video tennistici"** Fondo Sociale Europeo, competitive grant, local funding **24000 Euro,** 1 temporary research associate hired
  - ◦ **2013** Principal Investigator "**Ricostruzione 3D e analisi della forma del piede per l'industria calzaturiera"** funded by European Social Fund, , competitive grant, local funding **24000 Euro,** 1 temporary research associate hired
  - ◦ **2006-2010** Key personnel in Marie Curie RTN **3D Anatomical Human (MRTN-CT-2006-035763 (at CRS4)**
  - ◦ **2006** Member of Cagliari Unit of the PRIN 2006 Tecniche di Indicizzazione e Reperimento di Forme Tridimensionali (3-SHIRT) (with University of Cagliari)
  - ◦ **2004-2008** Key personnel in the project **COHERENT (IST-FP6-510166), (at CRS4)**
  - ◦ 1999 Key personnel in the project **ViVa** (Virtual Vascular, Eureka program 1997-99) **(at CRS4)**
  - ◦ **2000-2002** Key personnel in the project **IERAPSI (IST-1999-12175). (at CRS4)**
  - ◦ **2000-2004 Technical Project Manager of the European project AQUATICS, part of the cluster EUTIST-M (IST-1999-20226/AQUATICS), (at CRS4)**
  - ◦ **2001** Key personnel in the project URBAN (MIUR D. D. 784 Ric. 24/07/2001) aimed at the reconstruction of functional brain models from histological sections, **(at CRS4)**

  - ◦ **Other**
    - ▪ Coordinator of a FP7 STREP proposal (**SANDMED**, Virtual Physiological Human) positively evaluated but not funded in 2012. Proect awarded with **2903** Euros by University of Verona
    - ▪ Head of the Verona unit in another STREP proposal positively scored but not funded

(SINEMA).

- Leader of the Verona Unit in the proposal PRIN 2010-2011 ATMAN that passed the first selection but was not directly funded. Proect awarded with **1456 Euro** from the University of Verona
- 1UNIVR-**Cooperint type B grant** (2013), project **Detection and localization of retinal diseases: analyzing experts' annotations to develop robust automatic techniques. (1500 Euro)**

Project reviewing

- **Expert reviewer for the European commission** for evaluation and monitoring of research projects (three project reviews performed).

- Member of the Register of Experts of the Italian ministry of University and Scientific Research. Review of **research grant applications for Regione Toscana** (2021)

Conference chairing/organization

- Conference chair **STAG Smart Tools and Apps for Graphics** 2024, Verona
- **State of the Art Chair Eurographics 2019 conference,** Genova
- **Local chair, 3DV 2018**, Verona
- **Program chair** of **STAG 2017** (Smart Tools and Applications in computer Graphics), Catania September 2017
- **Program chair,** Eurographics Workshop on **3D Object Retrieval 2016, Lisbon**.
- **Doctoral Consortium Chair, CHItaly 2017, Cagliari**
- **Best thesis** award chair, **STAG Smart Tools and Apps for Graphics 2016, Genova**.
- **Program chair, STAG Smart Tools and Apps for Graphics** 2014 Cagliari - September 22-23
- **Local Chair, STAG 2015** (Smart Tools and Applications in computer Graphics, Verona, 15-16/10 2015)
- Co-organizer of **Eurographics Italian Chapter Conference 2009,** Verona

Organization of scientific contests

- Organizer of the contest on **SHREC'22 Track on track on online detection of heterogeneous gestures** within the Eurographics Workshop on 3D Object Retrieval 2022
- Organizer of the contest on **SHREC'21 Track on Skeleton-based Hand Gesture Recognition in the Wild** within the Eurographics Workshop on 3D Object Retrieval 2021.
- Organizer of the contest on **SHREC'19 track: Online gesture recognition** within the Eurographics Workshop on 3D Object Retrieval 2019.
- Co-organizer of the contest on **SHREC'17 track: Retrieval of surfaces with similar relief patterns** within the Eurographics Workshop on 3D Object Retrieval 2017.
- Organizer of the contest on **Retrieval of Human Subjects from Depth Sensor Data** within the Eurographics Workshop on 3D Object Retrieval 2016.
- Organizer of the contest on **Retrieval of nonrigid and textured shapes from low quality scans** within the Eurographics Workshop on 3D Object Retrieval 2015.
- Organizer of the contest on **Automatic Location of Landmarks used in Manual Anthropometry** within the Eurographics Workshop on 3D Object Retrieval 2014.

Program committees

Program committee member of the following conferences:

- International Conference on Graphics and Interaction 2023, 2022
- Eurographics Workshop on 3D Object Retrieval 2023, 2020, 2019,201,2017, 2016, 2015
- Eurographics Smart Tools ana Application in Graphics STAG) 2024-2014
- VISAPP 2024,2023,2022,2021
- IMPROVE 2024,2023,2022,2021
- Eurographics Education papers 2022

- VIDEM 2020: Workshop on Visual Interface Design Methods
- Eurographics 2019
- CHITALY 2017
- MIUA 2017
- VIDEM 2020
- 3D Body Scanning Technologies 2012-2016
- AVSS2013
- NORDIA 2012, IARIA-ICDT 2009-2013, HSI2010 track on Human Machine Interaction, 3D Physiological Human 2009, 3D Physiological Human 2008.

Editorial tasks
- Guest editor, **Computers & Graphics Journal,** Special Section on Recent Advances in Graphics and Interaction. 2022, and for special issues on STAG 2024, STAG 2017 and STAG 2015
- **Guest editor** for the Special Issue **"Smart Sensors Data Processing and Visualization in Cultural Heritage"** of Sensor Journal (2020)
- **Associate editor o**f Journal of Graphics Tools for special issue on STAG 2014.
- Former member of the editorial committee of the journal ISRN Signal Processing
- **Review**er for the journals:
  ◦ Medical Image Analysis, Journal on Computing and Cultural Heritage, Image and Vision Computing, IEEE Transactions on Image Processing, IEEE Transactions on Medical Imaging, IEEE Transactions on Biomedical Engineering, Computer Graphics Forum, Pattern Recognition Letters, Computer Vision and Image Understanding, Plos ONE, Computers and Graphics, IEEE Journal of Biomedical and Health Informatics, Journal of Visual Communication and Image Representation, Artificial Intelligence in Medicine, IEEE Transactions on circuits and systems for video technology, Computer Methods and Programs in Biomedicine, Signal, Image and Video Processing; Computer-Aided Design; International Journal of Biomedical Imaging, SPIE Journal on Medical Imaging, SPIE Journal on Electronic imaging, Computers in Biology and Medicine, Journal of Medical and Biological Engineering, IET Image Processing, Parallel Computing, ETRI Journal, EURASIP Journal on Image and Video Processing, ELCVIA, CAIM Journal, 3D Research, Image Communication, IET Science, Measurement & Technology, Biocybernetics and Biomedical Engineering and others
- Reviewing for the conferences CVPR, ECCV, BMVC, Eurographics, IEEE-VR, ACM Siggraph, CHI, CGI, and many more

Visiting
Feb-March 2014 University of Dundee (UK), CVIP group (prof. E.Trucco) 1 month, working on the VAMPIRE multicentric project on retinal image analysis

Invited talks
- Robust methods for shape analysis - University of Lugano (2012)
- 3D shape analysis methods and applications (2014) - University of Dundee
- Processing human 3D models and extracting measurements for indirect body fat estimation - Robert Gordon University, Aberdeen (2014)
- 3D shape analysis methods and applications IMATI - Genova (2015)
- 3D shape analysis methods and applications IIT - Genova (2016)

Awards
Best paper award EUROGRAPHICS Workshop on Graphics and Cultural Heritage (GCH) 2019 – Sarajevo, Bosnia and Herzegovina, November 6 – 9, 2019 A.Jaspe Villanueva, E. Gobbetti, A.Giachetti Web-based Multi-layered Exploration of Annotated Image-based Shape and Material Models

Best paper award Eurographics workshop on Graphics and Cultural Heritage 2017 (GCH) Graz: A. Giachetti, I Ciortan, C Daffara, R Pintus, E Gobbetti **Multispectral RTI analysis of heterogeneous artworks**

Best paper award EG Smart Tools and Apps in computer Graphics (STAG) 2017 – Catania, Sept 11-12 2017: Fabio Marco Caputo, Pietro Prebianca, Alessandro Carcangiu, Lucio D. Spano, and Andrea Giachetti **A 3 Cent Recognizer: Simple and Effective Retrieval and Classification of Mid-air Gestures from Single 3D Traces**

Research group

I coordinate the INTELLIGO-GRAIL (Graphics and Interaction lab) currently composed of one RTDa (Ariel Caputo), 2 PhD students (Shakir Ullah, Deborah Pintani) and a research fellow (Marco Emporio). The group work in close collaboration with the machine learning area of the lab and strictly collaborates with several Italian and international groups (CRS4-Visual Computing Cagliari, CNR IMATI Genova, CNR-ISTI Pisa, CCHT IIT Venezia, University of Trento, University of Porto, NTNU Gjovik, University of Central Florida.

Research topics

HCI, interaction and gesture recognition. I recently worked on interaction analysis, in particular for mixed reality applications. A research line was dedicated to the development of novel gestural interaction paradigms for interaction in immersive virtual reality (particularly manipulation) [A44, A42, A30, A31, B88, B86, B76]. I worked also on navigation techniques, in particular analyzing design choices for sickness reduction [B117, B110, B106, B101, B79] and on the design of effective solution for mixed reality interface development [B106].

This research is conducted with the collaboration of different partners (University of Trento, University of Padova, University of Cagliari, IMATI-CNR, IST Lisbon, University of Porto) and also within the Hybrid Worlds and iNest proects..
I also investigate methods for hand gesture recognition, in particular for online recognition of heterogeneous gestures, developing novel method based on trajectory matching and Neural Networks and creating new benchmarks [A42, A38, A32, B111, B98, B87, B77]. The research is carried on in collaboration with the University of Central Florida (prof. Joseph LaViola)

Pattern design and 3D printing. I am currently working on methods for the design of decorative patterns over manifolds in the 3D space. This work is ongoing, in collaboration with University of Roma-La Sapienza (F.Pellacini) and University of Cagliari (R.Scateni) [A43,B115]. With the PhD activity of Filippo Andrea Fanni and within the activities of the Industrial Computer Engineering lab, I am also working on decomposition of shapes in custom and 3D printed LEGO blocks [B112]. Another interesting aspects is related to the description and recognition of patterns, as well to the semantic description of textures and I am working on it at UniVR in collaboration with prof. M.Cristani [B108, B100, B99].*Computer Vision.* I recently worked on characterization of surfaces from multi-light image capture also applied in the domain of Cultural Heritage. For example, in the framework of the EU project Scan4Reco I worked on acquisition (hardware and protocols) and processing methods (algorithms and software) to characterize appearance and roughness of materials used in artworks. This work has been performed also with the collaboration of CRS4 (Enrico Gobbetti) and ISTI-CNR Federico Ponchio) and resulted in several publications related to Reflectance Transformation Imaging, image visualization, Photometric Stereo. [B114, A40, A35, A29, B109, B103, B96, B95, B89, B85, B81, B80,B74,B63]. The project aimed at characterize materials' features and aging using multimodal acquisition. In the D-Surf PRIN project I also worked on characterization of surface properties from images. In the PhD thesis of Tinsae Dulecha we also worked on relightable images based on autoencoders and on novel Photometric Stereo benchmarks [A39, B107]. For the applications in Cultural Heritage I am now working also in a milticentric proect with NTNU Trondheim, Norway, and IIT/CCHT Venezia (PhD of Leonardo Righetto project funded on DM 351) and I will work within the recently funded Prin 2022 REFLEX.

Shape analysis. I worked on the development of methods for salient points recognition, skeleton

extraction and segmentation of 3D models, with relevant applications on anthropometric studies [B45, B47, B48, B53, B56]. In particular, I designed a method to characterize radial (spherical and cylindrical) symmetries in 3D models the Area Projection Transform [A17], useful also to compute shape signatures and applied with success on different shape retrieval tasks, e.g. protein shape retrieval, relief patterns retrieval, human body shape retrieval. I organized several shape retrieval contests. [B45, B47, B48, B52, B56, B67, B68, B69, B73, B78, B83, B90, B105, A25, A27, A34, A36, A37, A41]. I also developed with Valeria Garro a novel graph-based shape characterization method using spectral analysis on the Riemannian manifold, graph-based encoding of shapes, and graph matching techniques [A26]. I worked on algorithms for curve skeleton estimation, [B47, B65], pose estimation, salient points matching. This research is carried on in collaboration with CNR-IMATI.

Digital Anthropometry I worked with professor Carlo Zancanaro (UNIVR, dept. of Neuroscience, Biomedicine and Movement) on projects related to the analysis of the human body. In this context we performed research on automatic analysis of 3D body scanning data for body type characterization and fat estimation [A22, A20, A19] and estimation of composition parameters from depth images [B93].

Medical segmentation and 3D models reconstruction. I developed methods the reconstruction of 3D organ models from medical datasets [A4, A8, B29], working in related tasks of EU-funded projects at CRS4. I was also involved in the VAMPIRE project (*https://vampire.computing.dundee.ac.uk*), led by the University of Dundee and focused on the development of software tools for retinal image analysis and on clinical applications. In this project I designed algorithms for retinal features' characterization, and I realized parts of software tools used by the research group in clinical studies [A21, A18, B53, B54, B56, B57].

Image Processing. I developed artifact free 2D and 3D image interpolation methods. The ICBI algorithm is quite popular and the implementations available on the site *www.andreagiachetti.it* have been widely tested and used by several researchers [A16, B42, B43]. I also worked on texture analysis methods applied to medical images for classification and segmentation of tissues [B33, B36].

Visualization and interaction. I worked in projects employing light-field displays to create 3D visualization tools [A3, B6, B8], and in this context I developed a gesture-based interface for the interaction with 3D models [B40]. I also contributed to the development of a web base visualization tool for medical and neurophysiological studies [A14].

Surgical simulation. In the context of q research project developing surgical simulation tools I worked on tasks related to the integration of tissue classification methods into the interaction framework [A9]

Medical data management and PACS systems. I worked in the development of systems for the handling of medical information in hospitals, testing DICOM connection, supporting connectivity and data interchange in different applications, also web based [B8, B11].

Blood flow simulation. He worked in projects aimed at the simulation of blood flow inside vessels, not only reconstructing patient specific vascular models but also working with commercial simulators and tetrahedral mesh builders [A5, B9].

Motion and optical flow. During the period spent at University of Genova, I mainly worked on motion analysis (e.g. development of optical flow estimation algorithms [A6, C7] and motion parameters estimation technique [A2]) applying the techniques developed to several practical applications, like road sequences interpretation for autonomous vehicles [A3, C6], tracking in medical images [A4], biological tissues analysis [A7], satellite images analysis [A11].

Public codes

Demo codes of selected works are available at the web site www.andreagiachetti.it or on **https://github.com/giach68**. In particular, the Matlab, C and CUDA implementation of ICBI upscaling code and the C++, code for the estimation of Multiscale Area Projection Transform, C++ tools for RTI stack (multi light image) processing.

Member of associations:

Eurographics, CVPL, ACM

Scientific publications

Journal Papers

A55) Dulecha, T. G., Righetto, L., Pintus, R., Gobbetti, E., & Giachetti, A. (2025). **Fast and accurate neural reflectance transformation imaging through knowledge distillation**. *Computers & Graphics*, 104475.

A54) Busellato, L., Cunico, F., Dall'Alba, D., Emporio, M., Giachetti, A., Muradore, R., & Cristani, M. (2025). **Uncertainty Aware-Predictive Control Barrier Functions: Safer human robot interaction through probabilistic motion forecasting**. *Robotics and Autonomous Systems*, 105291

A53) Monaro, M., Bettelli, A., Portello, G., Pierobon, L., Orso, V., Caputo, A., Giachetti. A ... & Gamberini, L. (2025). **Enhancing shopping experience in augmented reality by customizing product manipulation modalities: A customer experience study**. *International Journal of Human-Computer Studies*, *202*, 103553.

A52) Ponchio, F., Bettio, F., Marton, F., Pintus, R., Righetto, L., Giachetti, A., & Gobbetti, E. (2025). **OpenLIME: An open and flexible web framework for creating and exploring complex multi-layered relightable image models.** *Proc. digital heritage*, 1-10.

A51) Emporio, M., Ghasemaghaei, A., Laviola Jr, J. J., & Giachetti, A. (2025). **Continuous hand gesture recognition: Benchmarks and methods.** *Computer Vision and Image Understanding*, *259*, 104435.

A50) Pintani, D., Caputo, A., Mendes, D., & Giachetti, A. (2025). **Layer-based management of collaborative interior design in extended reality. Behaviour & Information Technology**, 1-17

A49) Righetto, L., Khademizadeh, M., Giachetti, A., Ponchio, F., Gigilashvili, D., Bettio, F. and Gobbetti, E., 2024. **Efficient and user-friendly visualization of neural relightable images for cultural heritage applications**. *ACM Journal on Computing and Cultural Heritage*, pp.1-24.

A48) Caputo, A., Bartolomioli, R., Orso, V., Mingardi, M., Da Granaiola, L., Gamberini, L. and Giachetti, A., 2024. **Comparison of deviceless methods for distant object manipulation in mixed reality**. *Computers & Graphics*, p.103959.

A47) Marco Emporio, Ariel Caputo, Deborah Pintani, Dong Seon Cheng, Thomas De Marchi, Gianmaria Forte, Franco Fummi, and Andrea Giachetti. 2024. **Integration of Extended Reality with a Cyber-Physical Factory Environment and its Digital Twins**. Proc. ACM Hum.-Comput. Interact. 8, EICS, Article 250 (June 2024), 13 pages. https://doi.org/10.1145/3660246

A46) Veldhuijzen, B., Veltkamp, R.C., Ikne, O., Allaert, B., Wannous, H., Emporio, M., Giachetti, A., LaViola Jr, J.J., He, R., Benhabiles, H. and Cabani, A., 2024. **SHREC 2024: Recognition of dynamic hand motions molding clay**. *Computers & Graphics*, *123*, p.104012

A45) F Cunico et al Enhancing Safety and Privacy in Industry 4.0: The ICE Laboratory Case Study IEEE Access Digital Object Identifier 10.1109/ACCESS.2024.3479411

A44) Emporio, M., Caputo, A., Giachetti, A., Cristani, M., Borghi, G., D'Eusanio, A., ... & von Tycowicz, C. (2022). **SHREC 2022 track on online detection of heterogeneous gestures.** Computers & Graphics, 107, 241-251.

A43) Fanni, FA, Scateni, R., Pellacini F, Giachetti, A. **PAVEL: Decorative Patterns with Packed Volumetric Elements** ACM Transactions on Graphics, 41, 2, Article 19 (April 2022),

A42) Caputo, A., Giachetti, A. et al. **SHREC 2021: Skeleton-based hand gesture recognition in the wild** (2021) Computers and Graphics (Pergamon), 99, pp. 201-211.

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Quanto dichiarato in questo curriculum corrisponde a verità e le dichiarazioni rese nel curriculum sono rilasciate ai sensi degli articoli 46 e 47 del D.P.R. 445/2000

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