Marco Fratarcangeli

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Research interests

Interactive graphics, computational animation, high-performance computing and virtual characters.

Academic Experience

2016–today	**Associate Professor at Chalmers University of Technology, Sweden.**
2014–2016	**Senior Lecturer at Chalmers University of Technology, Sweden.**
2011–2014	**Assistant Professor at Sapienza University of Rome, Italy.**
07 2017	**Visiting Professor at Disney Research Zurich, Switzerland.**
03-07 2014	**Visiting Professor at Tèlècom ParisTech, France.**

Education

2004–2009	**Ph.D. in Computer Engineering, Sapienza University of Rome, Italy.** Thesis: *Computational Models for Animating Virtual Faces*. Supervisors: Marco Schaerf and Robert Forchheimer.
2004–2006	Visiting Ph.D. Student at Linköping Institute of Technology, Sweden. Research in face animation for model-based coding.
2004	M.Sc. (Laurea) in Computer Engineering. Sapienza University of Rome, Italy.

Industrial Experience

2017–today	**Chairman of the Board, Deform Dynamics AB, Sweden**
2006–today	**Board member and co-owner, Visage Technologies AB, Sweden.** http://www.visagetechnologies.com/.
2009–2011	**Senior Software Engineer at Taitus Software srl, Italy.** Project technical lead, visualization tools for analysis and planning of Earth Observation missions for the European Space Agency.

Fellowships and Grants

2016–2018	**Interactive 3D deformable bodies.** Vetenskapsrådet (Swedish Research Council), Starting grant, acceptance ratio $< 9\%$, sole applicant
2016–2018	**Interactive cloth animation research.** IKEA Communications AB, Industrial research project, sole applicant
2017	**Parallel Algorithms for Interactive Simulations of 3D Soft Tissues.** Stiftelsen för internationalisering (STINT), PI
2016–2017	**ImageLife2 & ImageLife.** Chalmers Area of Advance ICT, Seed projects
2014	**Anatomically-inspired Face Animation for Behavioral Realization.** Telecom ParisTech, sole applicant
2012–2015	**Surgical Threads Simulations Based on a Novel Information-Theory Approach**, Qatar National Research Foundation
2004	Three years fellowship awarded from the Italian Ministry of Research (MIUR) to support my PhD studies.

Supervision

2016–today	**Tomasz Kosiǹski.** PhD student. Field: Human-Computer Interaction, deep neural networks. Role: co-supervisor. Main supervisor: Prof. Morten Fjeld.
2012–2015	**Nadine Abu Rumman.** PhD thesis, title: *Position-based Skin Deformations for Interactive Character Animation*. Field: Computer Engineering. Role: Main supervisor.

PhD Thesis Committee

2016	**Jasper Molin.** Chairman, Chalmers, Sweden.
2016	**Viktor Kämpe.** Evaluation Committee, Chalmers, Sweden.
2014	**Jon Denning.** Evaluation Committee, Dartmouth College, USA

Awards

2014	**Best Paper Award** at ACM Spring conference on Computer Graphics (SCCG).
2006	**Best Paper Award** at RoboCup International Symposium.
2004	**Honorable mention for the best ICT Master Thesis in Italy.** *Federcom-Aica yearly recognize the best Italian master thesis in Information and Communication Technologies.*

Teaching

2017	Lecturer (MSc), Game Engine Architecture, Chalmers, Gothenburg, Sweden.
2016	Lecturer (MSc), Game Engine Architecture, Chalmers, Gothenburg, Sweden.
2015	Lecturer (MSc), Game Engine Architecture, Chalmers, Gothenburg, Sweden.
2013	Lecturer (MSc), Computer Graphics, Sapienza, Rome, Italy.
2011	Lecturer (PhD), Interactive Objects in Gaming Application, Sapienza, Rome, Italy.
2012	Lecturer (MSc), Computer Graphics, Sapienza, Rome, Italy.
2011	Lecturer (PhD), General-purpose computing on graphics processing units (GPGPU), Sapienza, Rome, Italy.
2007	Teaching Assistant (MSc), Computer Graphics, Sapienza, Rome, Italy.
2004	Teaching Assistant (MSc), Computer Graphics, Sapienza, Rome, Italy.

Commissions of Trust

2016	Scientific Evaluator, Italian Ministry of Education, Universities and Research (MIUR) for Projects of national interest (PRIN).
2016	Scientific Evaluator, Icelandic Research Fund (IRF), Grant of excellence.
2014	Scientific Evaluator, Ministry of Business, Innovation & Employment of New Zealand

Organization of Scientific Meetings

2017	Conference chair, ACM Virtual Reality Software and Technology (VRST)
2017, 2016 2015	PC Member, Eurographics Smart Tools and Apps in Computer Graphics
2016	PC Member, ACM NordiCHI, Nordic Conference on Human-Computer Interaction
2017	PC Member, ACII, Affective Computing and Intelligent Interaction
2017, 2016	PC Member, DiGRA/FDG Digital Games Research, Foundations of Digital Games
2014	PC Member, SIGRAD, Eurographics Swedish Chapter

Service as Reviewer

Eurographics (2018, 2017, 2013 2012, 2011, 2010), SIGGRAPH (2017), Pacific Graphics (2017), Graphical Models (2017, 2016 2015), Computer Animation and Virtual Worlds (2017, 2015 2013), SIGGRAPH Asia (2016, 2010), ACM Transaction on Graphics (2016), Computer Graphics Forum (2016), Computer & Graphics (2016), Journal of Graphical tools (2015, 2014), IEEE Transactions on Circuits and Systems for Video Technology (2015), International Journal of High Performance Computing (2015), ACM Transactions on Affective Computing (2014), Computer Animation and Social Agents (2014), CGI (2012), ACM Transactions on Haptics (2011), Virtual Reality Interaction and Physical Simulation (2010), Eurographics short papers (2006)

Invited Talks

10/2017	*Fast, Interactive Deformable Bodies* ICCV Workshop on Image-based Modeling of Articulated and Deformable Objects, Venice, Italy. Invited by Fiora Pirri.
06/2017	*Sustainability in the digital world* International Society for Information Studies Summit (IS4SI), Gothenburg, Sweden. Invited by Gordana Dodig-Crnkovic.
02/2017	*Interactive Solving of Large and Sparse Linear Systems*. Bellairs Workshop on Computer Animation, Barbados. Invited by Paul Kry.

International Conference Talks

2016	SIGGRAPH Asia, Macau, China.
2015	Eurographics, Zurich, Switzerland.
2014	SIGRAD, Eurographics Swedish Chapter, Gothenburg, Sweden.
2012	ACM Symposium on Facial Analysis and Animation. Vienna, Austria.
2012	Computer Animation and Social Agents (CASA), Singapore.
2005	Eurographics, Short papers session. Dublin, Ireland.
2005	IEEE Image and Signal Processing and Analysis (ISPA). Zagreb, Croatia.
2005	Virtual Reality and Physical Simulations(VriPhys). Pisa, Italy.
2004	Computer Animation and Social Agents (CASA), Geneva, Switzerland.

Publications

Journal Articles

11. Huang J., Wang Q., Fratarcangeli M., Yan K., Pelachaud C.: Multi-variate gaussian-based inverse kinematics. *Computer Graphics Forum* (2017), n/a–n/a

10. Wang Z., Fratarcangeli M., Ruimi A., Srinivasa A.: Real time simulation of inextensible surgical thread with force output for haptic feedback applications. *International Journal of Solids and Structures* (2017), –

9. Fratarcangeli M., Tibaldo V., Pellacini F.: Vivace: A practical gauss-seidel method for stable soft body dynamics. *ACM Trans. Graph. (Siggraph ASIA) 35*, 6 (Nov. 2016), 214:1–214:9

8. Huang J., Fratarcangeli M., Ding Y., Pelachaud C.: Inverse kinematics using dynamic joint parameters. *The Visual Computer* (2016), 1–13

7. Fratarcangeli M., Pellacini F.: Scalable partitioning for parallel position based dynamics. *Computer Graphics Forum (Eurographics) 34*, 2 (2015), 405–413

6. Marcuš N., Fratarcangeli M., Pandzic I., Ahlberg J.: Fast rendering of image mosaics and ascii art. *Computer Graphics Forum 34*, 6 (September 2015), 251–261

5. Rumman N. A., Fratarcangeli M.: Position-based skinning for soft articulated characters. *Computer Graphics Forum 34*, 6 (2015), 240–250

4. Fratarcangeli M., Pellacini F.: A GPU-based implementation of position based dynamics for interactive deformable bodies. *Journal of Graphics Tools 17*, 03 (2015), 59–66. Invited Paper

3. Fratarcangeli M.: Position-based facial animation synthesis. *Computer Animation and Virtual Worlds 23*, 3-4 (2012), 457–466

2. Zaratti M., Fratarcangeli M., Iocchi L.: A 3d simulator of multiple legged robots based on usarsim. *RoboCup 2006: Robot Soccer World Cup X 4434* (2007), 13–24

1. Fratarcangeli M., Schaerf M., Forchheimer R.: Facial motion cloning with radial basis functions in mpeg-4 fba. *Graphical Models 69*, 2 (2007), 106–118

Book Chapters

3. Rumman N. A., Fratarcangeli M.: *Skin Deformation Methods for Interactive Character Animation*. Springer International Publishing, Cham, 2017, pp. 153–174

2. Fratarcangeli M.: Comparing glsl, opencl and cuda: cloth simulation on the gpu. In *Game Engine Gems 2*, Lengyel E., (Ed.), 1 ed. A K Peters/CRC Press, February 2011, ch. 22, pp. 365–379

1. Fratarcangeli M.: A versatile and interactive anatomical human face model. In *Game Programming Gems 8*, Lake A., (Ed.), 1 ed. Cengage Learning PTR, March 2010, ch. 2.1, pp. 121–132

International Refereed Conferences

17. Calabrese C., Fratarcangeli M., Pellacini F.: sLayer: a System for Multi-Layered Material Sculpting. In *Eurographics Symposium on Rendering - Experimental Ideas & Implementations* (2017), Zwicker M., Sander P., (Eds.), The Eurographics Association

16. Nelson V., Mc Evoy P., Fratarcangeli M.: Practical offline rendering of woven cloth. In *STAG: Smart Tools and Apps in Computer Graphics* (2016)

15. Rumman N. A., Fratarcangeli M.: State of the art in skinning techniques for articulated deformable characters. In *Proceedings of the 11th Joint Conference on Computer Vision, Imaging and Computer Graphics Theory and Applications* (2016), pp. 198–210

14. Dancu A., Fratarcangeli M., Fourgeaud M., Franjcic Z., Chindea D., Fjeld M.: Low-cost Experimental Setups for Mid-air 3D Reconstruction. In *Smart Tools and Apps for Graphics - Eurographics Italian Chapter Conference* (2015), Giachetti A., Biasotti S., Tarini M., (Eds.), The Eurographics Association

13. Rumman N. A., Fratarcangeli M.: Position based skinning of skeleton-driven deformable characters. In *ACM Spring Conference on Computer Graphics* (2014), SCCG '14, ACM, pp. 83–90. Best paper award

12. Fratarcangeli M., Pellacini F.: Towards a massively parallel solver for position based dynamics. In *SIGRAD, Swedish Chapter of Eurographics* (Göteborg, Sweden, June 2014), Computing V., (Ed.)

11. Tiriticco D., Fratarcangeli M., Ferrara R., Marra S.: Near real-time multi-gpu ωk algorithm for sar processing. In *IEEE Geoscience and Remote Sensing* (October 2014), pp. 277–280

10. Murru G., Fratarcangeli M., Empler T.: Practical augmented visualization on handheld devices for cultural heritage. In *Computer Graphics, Visualization and Computer Vision* (2013), Agency V. S.-U., (Ed.)

9. Fratarcangeli M.: Interactive, musculoskeletal model for animating virtual faces. In *ACM Symposium on Facial Analysis and Animation* (September 2012), FAA '12, ACM, pp. 16:1–16:1

8. Fratarcangeli M., Andolfi M., Stankovic K., Pandzic I.: Animatable face models from uncalibrated input pictures. In *IEEE Conference on Telecommunications. ConTEL* (June 2009), pp. 177–184

7. Fanelli G., Fratarcangeli M.: A non-invasive approach for driving virtual talking heads from real facial movements. In *IEEE 3DTV Conference* (May 2007), pp. 1–4

6. Kubiak B., Pietroni N., Ganovelli F., Fratarcangeli M.: A robust method for real-time thread simulation. In *ACM Symposium on Virtual Reality Software and Technology* (2007), VRST '07, ACM, pp. 85–88

5. Zaratti M., Fratarcangeli M., Iocchi L.: A 3d simulator of multiple legged robots based on usarsim. In *Springer Robocup 2006 Symposium* (2006), Springer. Best paper award

4. Fratarcangeli M.: Physically based synthesis of animatable face models. In *Virtual Reality and Physical Simulation (Eurographics VRIPHYS)* (Pisa, Italy, November 2005), ISTI-CNR, Eurographics Association, pp. 32–39

3. Fratarcangeli M., Schaerf M.: Facial motion cloning using global shape deformation. In *Eurographics Short Papers* (Dublin, Ireland, August 2005), The Eurographics Association and The Image Synthesis Group, pp. 89–92

2. Fratarcangeli M., Schaerf M.: Fast facial motion cloning in mpeg-4. In *IEEE Image and Signal Processing and Analysis (ISPA)* (Zagreb, Croatia, September 2005), IEEE - Signal Processing Society, pp. 310–315

1. Fratarcangeli M., Schaerf M.: Realistic modeling of animatable faces in mpeg-4. In *Computer Animation and Social Agents* (Geneva, Switzerland, July 2004), MIRALAB, Computer Graphics Society (CGS), pp. 285–297