

CUI Activity Report 2022

1 – Team MIRALab - University of Geneva

- **Responsible**
Magenat-Thalmann Nadia, Honorary Professor



PhDs co-supervision in collaboration with Professor Jose Rolim:

- **PhD students (2022):**
Eva Baka

Hangyeol Kang
 - **Administration**
Giudicelli Elisabeth
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2 – Domain activities

- **Description of the activities of the laboratory**
MIRALab was founded in 1989 by Professor Nadia Magenat-Thalmann and has brought together PhD students and researchers from different fields, such as computer science, 3D graphics, 3D simulation, social robotics, 3D fashion design, and cognitive science. MIRALab is participating to the project INNOSUISSE, “the digital Patient” managed by the University of Geneva (Professor Jose Rolim) with partners as HUG and ORAMAVR SA.
- **Website:** <http://www.miralab.ch>

The following are some images of our work in INNOSUISSE project during 2022:

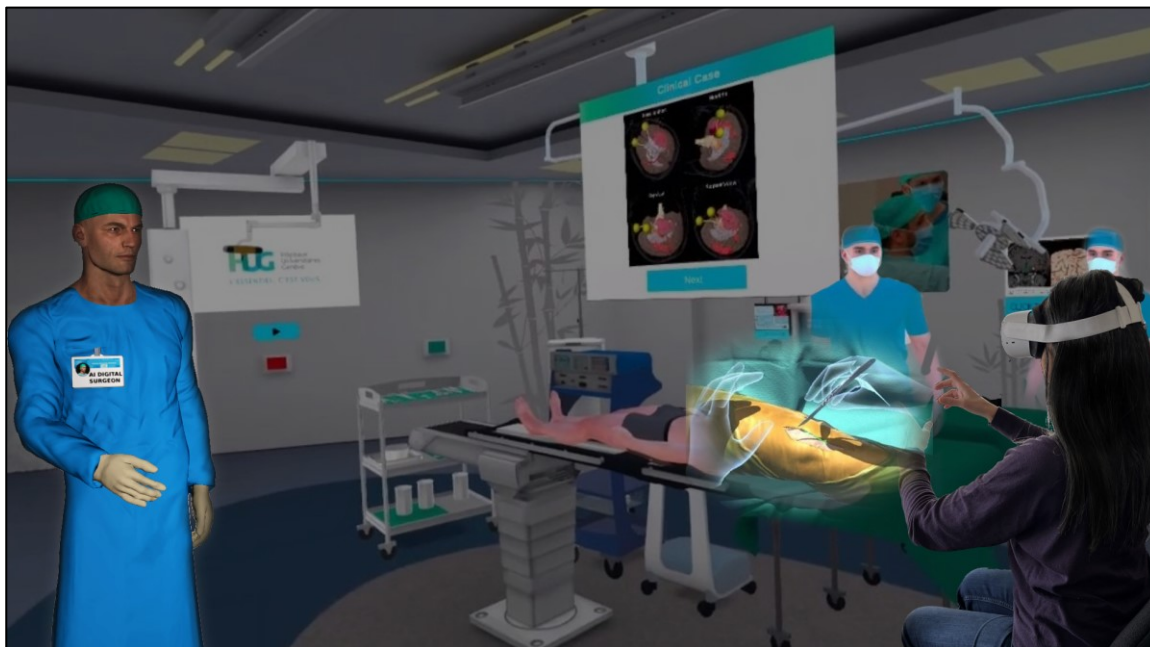


Figure 1 : Guiding trainees in virtual surgery



Figure 2 : Creating and animating the virtual 3D surgeon.

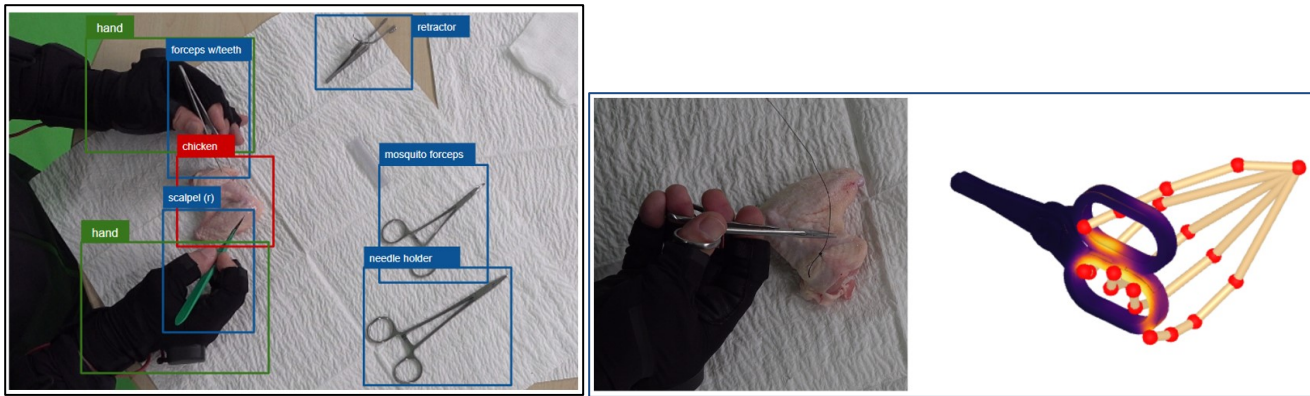


Figure 3 : Creating a Surgical Gesture Dataset

3 – PhD Thesis (Faculty of Sciences, mention interdisciplinary)

- Evangelia Baka
- **Title:** *A Multimodal Approach for Identification, Analysis, and Comparison of Human Emotional and Behavioural Patterns between Human – Human and Human – Technology Interaction.*
- **Date:** June 9, 2022.

4 – List of publications – Refereed papers in international journals

- Zhijie Zhang, Jianmin Zheng, Nadia Magnenat Thalmann: **Engagement estimation of the elderly from wild multiparty human–robot interaction.** Computer Animation and Virtual Worlds, 2022
- Nadia Magnenat Thalmann, Jinman Kim, George Papagiannakis, Daniel Thalmann, Bin Sheng: **Computer graphics for metaverse.** Virtual Reality & Intelligent Hardware, 2022
- Nidhi Mishra, Manoj Ramanathan, Gauri Tulsulkar, Nadia Magnenat Thalmann: **Uncanny valley for interactive social agents: An experimental study.** Virtual Reality & Intelligent Hardware, 2022
- Tianrui Liu, Yiyu Cai, Jianmin Zheng, Nadia Magnenat Thalmann: **BEACon: a boundary embedded attentional convolution network for point cloud instance segmentation.** The Visual Computer, 2022
- Nedjma Cadi Yazli, Evangelia Baka, Nadia Magnenat-Thalmann, Danae Kaplanidi, Nikolaos Partarakis, Effie Karuzaki, Manos Zidianakis, Andreas Pattakos, Xenophon Zabulis: **Modeling craftspeople for cultural heritage: A case study.** Computer Animation and Virtual Worlds, 2022
- Xenophon Zabulis, Nikolaos Partarakis, Carlo Meghini, Arnaud Dubois, Sotiris Manitsaris, Hansgeorg Hauser, Nadia Magnenat Thalmann, Chris Ringas, Lucia Panesse, Nedjma Cadi, Evangelia Baka, Cynthia Beisswenger, Dimitrios Makrygiannis, Alina Glushkova, Brenda

- Elizabeth Olivas Padilla, Danae Kaplanidi, Eleana Tasiopoulou, Catherine Cuenca, Anne-Laure Carre, Vito Nitti, Iliia Adami, Emmanouil Zidianakis, Paraskevi Doulgeraki, Effie Karouzaki, Valentina Bartalesi, Daniele Metilli: **A Representation Protocol for Traditional Crafts**. Heritage, 2022
- Hanhui Li, Xudong Jiang, Boliang Guan, Ruomei Wang, Nadia Magnenat Thalmann: **Multistage spatio-temporal networks for robust sketch recognition**. IEEE Transactions on Image Processing, 2022
 - Fok-Chi-Seng Fok Kow, Anoop Kumar Sinha, Zhang Jin Ming, Bao Songyu, Jake Tan Jun Kang, Hong Yan Jack Jeffrey, Galina Mihaleva, Nadia Magnenat Thalmann, Yiyu Cai: **MIDAS: Multi-sensorial Immersive Dynamic Autonomous System Improves Motivation of Stroke Affected Patients for Hand Rehabilitation**. arXiv preprint arXiv:2203.10536
 - Xinxing Xia, Frank Yunqing Guan, Yiyu Cai, Nadia Magnenat Thalmann: **Challenges and advancements for AR optical see-through near-eye displays: a review**. Frontiers in Virtual Reality, 2022, Vol 3, page 26.
 - Hansgeorg Hauser, Cynthia Beisswenger, Nikolaos Partarakis, Xenophon Zabulis, Iliia Adami, Emmanouil Zidianakis, Andreas Patakos, Nikolaos Patsiouras, Effie Karuzaki, Michalis Foukarakis, Aggeliki Tsoli, Ammar Qammaz, Antonis Argyros, Nedjma Cadi, Evangelia Baka, Nadia Magnenat Thalmann, Brenda Olivias, Dimitrios Makrygiannis, Alina Glushkova, Sotirios Manitsaris, Vito Nitti, Lucia Panesse: **Multimodal narratives for the presentation of silk heritage in the museum**. Heritage, 2022
 - Christodoulos Ringas, Eleana Tasiopoulou, Danae Kaplanidi, Nikolaos Partarakis, Xenophon Zabulis, Emmanouil Zidianakis, Andreas Patakos, Nikolaos Patsiouras, Effie Karuzaki, Michalis Foukarakis, Iliia Adami, Nedjma Cadi, Evangelia Baka, Nadia Magnenat Thalmann, Dimitrios Makrygiannis, Alina Glushkova, Sotirios Manitsaris, Vito Nitti, Lucia Panesse: **Traditional Craft Training and Demonstration in Museums**. Heritage, 2022
 - Anne Laure Carre, Arnaud Dubois, Nikolaos Partarakis, Xenophon Zabulis, Nikolaos Patsiouras, Elina Mantinaki, Emmanouil Zidianakis, Nedjma Cadi, Evangelia Baka, Nadia Magnenat Thalmann, Dimitrios Makrygiannis, Alina Glushkova, Sotirios Manitsaris: **Mixed-reality demonstration and training of glassblowing**. Heritage, 2022
 - X Zabulis, N Partarakis, C Meghini, A Dubois, S Manitsaris, H Hauser, N Magnenat Thalmann, C Ringas, L Panesse, N Cadi: **A Representation Protocol for Traditional Crafts**. Heritage 2022, 5, 716–741
 - Nadia Magnenat Thalmann: **Social robots: Their history and what they can do for us**. Perspectives on digital humanism, 2022
 - Li Tian, Jianmin Zheng, Yiyu Cai, Muhammad Faaiz Khan Bin Abdul Halil, Nadia Magnenat Thalmann, Daniel Thalmann, Hanhui Li: **Fast 3D Modeling of Prosthetic Robotic Hands Based on a Multi-Layer Deformable Design**. International Journal of Bioprinting, 2022

5 – List of publications – Full refereed papers in Conference Proceedings

- Zhijie Zhang, Jianmin Zheng, Nadia Magnenat Thalmann: **Real and Apparent Personality Prediction in Human-Human Interaction**. 2022 International Conference on Cyberworlds: 187-194
- Manoj Ramanathan, Aalind Singh, Arathy Suresh, Daniel Thalmann, Nadia Magnenat-Thalmann: **Virtual Safety Assistant: An Efficient Tool for Ensuring Safety During Covid-19 Pandemic**. Human-Computer Interaction. User Experience and Behavior: Thematic Area, HCI 2022, Held as Part of the 24th HCI International Conference, HCII 2022, Virtual Event, June 26–July 1, 2022, Proceedings, Part III
- Evangelia Baka, Nidhi Mishra, Emmanouil Sylligardos, Nadia Magnenat-Thalmann: **Social robots and digital humans as job interviewers: A study of human reactions towards a more naturalistic interaction**. Human-Computer Interaction. Technological Innovation: Thematic Area, HCI 2022, Held as Part of the 24th HCI International Conference, HCII 2022, Virtual Event, June 26–July 1, 2022, Proceedings, Part II
- Nidhi Mishra, Gauri Tulsulkar, Nadia Magnenat Thalmann: **Nadine Robot in Elderly Care Simulation Recreational Activity: Using Computer Vision and Observations for Analysis**. Human Aspects of IT for the Aged Population. Technology in Everyday Living: 8th International Conference, ITAP 2022, Held as Part of the 24th HCI International Conference, HCII 2022, Virtual Event, June 26–July 1, 2022, Proceedings, Part II

9 – PhD Thesis committee

PhD Thesis in preparation (Faculty of Sciences, mention interdisciplinary) in collaboration with Professor Jose Rolim

Hangyeol Kang

Title: *Intelligent Digital Surgeon: Deep Learning-based Surgical Activity Assistant for Medical Students*

- Basic surgical training, including incision and suturing, is crucial in the education of medical students.
- However, various reasons contribute to the lack of adequate training opportunities for these essential skills.
- The main objective of the research is to develop an AI-based intelligent digital surgeon that utilizes deep learning techniques to analyse and enhance the training of basic surgical skills for medical students.

10 – Conference/Program Chair and Festival Chair

September 2022 Conference Co-Chair, 39th Annual International Computer Graphics International (CGI 2022), Geneva, Switzerland (Fully virtual)

11 – Refereeing (Include any review for Journal)

- IEEE Transactions on Visualization and Computer Graphics, IEEE Computer Graphics and Applications, The Visual Computer, Graphics and Image Processing, Presence, ICAART (International Conference on Agents and Artificial Intelligence), International Conference on Signal Processing, Image Processing and Pattern Recognition; GRAPP (“International Conference on Computer Graphics Theory and Applications), Computer Graphics International, CASA conference, etc.
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12 – Editorial Responsibilities

2000-Present Editor-in-Chief of the Journal **the Visual Computer** published by Springer Verlag, Germany

2010-Present Editorial Adviser of the journal of **Graphical Models** published by Elsevier.

2010-Present: Associate Editor, Frontiers in Robotics, Nature Publisher

2000-Present Editor of the Journal of **Computational Geometry** published by Elsevier, Holland

13 – Events organised in Geneva or participation to Events

- **The 13th Science Night**, the Science History Museum, Geneva on 9 and 10 July 2022. Presentation of MIRALab contribution to MINGEI EU project on virtual preservation of Craft heritage.
- **Computer Graphics International (CGI)**, Geneva, Switzerland, 12-16 September 2022 - **online conference**.
- **The FIRST Global Challenge**, International Robotics Competition, 13-16 October

2022, Palexpo Genève. Presentation of the social Robot Nadine

- Presentation of Nadine Social Robot to the **Swiss Robotics days**, organized by EPFL, Palais de Beaulieu, Novembre 4, 2022
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14 – Invited talks, Keynotes, and Panellists

- Invitation to participate to the online **Panel**” Women Pioneers in **Computer Graphics and Visual Effects**, March 23, 2022, NVIDIA, USA
 - **Keynote** speech at **the conference ACM Multimedia (MMSYS) in Athlone** “Digital and Robotic humanoid twins: for which purposes? 15 June 2022, Ireland
 - **Keynote** speech at **Matera Digital Week**, on the session of AR/VR and Mixed Reality: vision of the future. Matera, Italy, June 24
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 - **Keynote** speech at **the third digital Fashion Innovation E-Symposium 2022**. “Pioneering 3D digital Fashion: from the Past to the Future”. June 29, Manchester.
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 - **Keynote** speech at ICVR 2022, **8th International Conference on VR**. “From automation to social Humanoid robots: a human dream”. 3-5 July, Nanjing, China
 -
 - **Invited Panellist** at the **International Union of Pure and Applied Physics, IUPA Centenary Symposium**. “Life outside the Academia”. July 13, Trieste, Italy
 - **Keynote** speech at the **12th edition of the online conference on nursing education and practice**. “A humanoid social assistive robot to promote the well-being of elderly”. December 13, 2022
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15– Honours and scientific awards

- Selected in the Magazine **Science to go** published by Wiley: Science Heroes: [Women in Engineering](#), Winter Semester 2021-22