Marco Ferro

Curriculum Vitae

WORK EXPERIENCE

Post-doctoral Research Jun. 2019 - Present

Sapienza University of Rome

Post-doctoral Research Fellow addressing estimation and rendering of contact forces in surgical robotics for teleoperation control schemes, through the employment of an industrial robot manipulator and a Geomagic Touch haptic interface.

Tutoring and assistance to students from Artificial Intelligence and Robotics Master course, for the realization of the final exam project in Medical Robotics and UAV control.

Tutor May 2019 - Present

University UNINETTUNO

Assisting activity to Master students for the course "Automazione dei Processi Industriali" in Management Engineering.

Tutor in Operational Research Jan 2020

Université de Lorraine, Nancy, France

Tutoring and assisting students from classes *prépas* during exercise and pratical sessions of the course.

Contract work Sept. 2019

Medlogix s.r.l.

ALBAON 4000 Image-guided positioning system ALBA GPS.

Implementation of a C++ multi-thread framework to achieve online tracking of radiative antennas employed for oncological hyperthermia, through the use of the external optical tracking system NDI Polaris and the virtual environment V-REP.

Contract work Jan. - Feb. 2019

Sapienza University of Rome

Highly qualified activity as "Engineering of an integrated simulator of teleoperation for the surgical robot da Vinci". Implementation of a C++ multi-thread framework to simulate the teleoperation of the da Vinci robot in the V-REP environment with haptic interfaces and virtual reality headset.

EDUCATION

Ph. D. in Automatica, Bioingegneria e Ricerca Operativa 2015-2018

Sapienza University of Rome

Research activity in vision-based robot navigation, object pose estimation and Structure-from-Motion problems. Educational activity in taking lectures for groups of Master students and managing students' exam projects.

M.Sc. in Artificial Intelligence and Robotics 2012-2015

Sapienza University of Rome

Master in English. Focus on basics of Robotics, A.I., Machine Learning, Computer Graphics and Vision. Analysis and control of industrial, mobile, aerial and surgical robots. Robot programming and simulation. Reinforcement learning for path planning. Microcontroller system design with Arduino.

Final grading: 110/110 cum laude

Thesis: Vision-based navigation for vehicles autonomously driven by humanoid robots. (**Advisors**: Marilena Vendittelli and Andrea Cherubini)

B.Sc. in Computer Engineering 2009-2012

University of Naples Federico II

Basics of Maths and Physics. Electronics, Programming, System Theory and Automation. Programming in C/C++ and MATLAB. Operating Systems and Computer networks.
Final grading: 104/110
Thesis: Vehicle velocity control problem. (**Advisor**: Mario Di Bernardo)

ABROAD EXPERIENCES

Visiting scholar 2018
Institut de Recherche en Informatique et Systèmes Aléatoires (IRISA) de Rennes
A semester of Ph.D. research activity abroad, in Rennes, France. Analysis and design of dense visual measurement for active Structure-from-Motion problems. Teamworking in international context.

Internship 2015
Laboratoire d'Informatique, de Robotique et de Microelectronique de Montpellier (LIRMM)
Master thesis preparation in Montpellier, France. Analysis of vehicle navigation for humanoid robots, with experiments performed on the robotic platform HRP-4.

LANGUAGES

Italian	Mother tongue
English	C1 (proficient).**Certificate**: Grade 8 in Graded Examination in Spoken English, Trinity College of London, 15-03-2009
French	A1 (basic).

SKILLS

Programming languages	C/C++, MATLAB, Python, LaTeX
Software/libraries	Visual Studio, ROS, MATLAB/Simulink, Eclipse, OpenCV, Eigen OpenGL
Job-related	Good capability in explaining arguments and taking classes to group of students. Good capability in handling and organizing the work, managing groups of students for their team projects.
Communication	High aptitude in living in multicultural contexts. Capability to speak, interact and hold technical and informal conversations in English. Capability to hold public speeches to the scientific community.
Organisational	Good capability in critically reading, analysing and summarizing scientific documents. Good capability in elaborating and proposing novel approaches and solutions, with respect to a problem of interest. High capability in implementing proposed solutions in common programming languages.

PUBLICATIONS

International Journals

- M. Ferro, A. Paolillo, A. Cherubini and M. Vendittelli, "*Vision-based navigation of omnidirectional mobile robots*". In IEEE Robotics and Automation Letters, April 2019.

- G. A. Fontanelli, M. Selvaggio, M. Ferro, F. Ficuciello, M. Vendittelli and B. Siciliano, "*Portable dVRK: an augmented V-REP simulator of the da Vinci Research Kit*". Submitted to 2019 Acta Hungarica Polytechnica.

- *(Under review)* M. Ferro, C. Gaz, M. Anzidei and M. Vendittelli, "*Enhanced sensing of needle-tissue interaction force in interventional procedures supported by robots*". Submitted to IEEE Transactions on Medical Robotics and Bionics (T-MRB), 2021.

International Conferences

- L. Saiella, A. Cristofaro, M. Ferro and M. Vendittelli, "*Fault-tolerant formation control of a team of quadrotors with a suspended load*", 2021 International Conference on unmanned aircraft systems, Athens, Greece.

- M. Ferro, D. Brunori, F. Magistri, L. Saiella, M. Selvaggio, G. A. Fontanelli, "*A portable da Vinci simulator in virtual reality*". In 2019 Third IEEE International Conference on Robotic Computing (IEEE IRC), Naples, Italy, February 2019.

- G. A. Fontanelli, M. Selvaggio, M. Ferro, F. Ficuciello, M. Vendittelli and B. Siciliano. "*A V-REP Simulator for the da Vinci Research Kit Robotic Platform*". In 7th IEEE RAS/EMBS International Conference on Biomedical Robotics and Biomechatronics, Enschede, The Netherlands, August 2018.

- M. Ferro, A. Paolillo, A. Cherubini, M. Vendittelli. "*Omnidirectional humanoid navigation in cluttered environments based on optical flow information*". In 16th IEEE-RAS International Conference on Humanoid Robots, Cancún, Mexico, November 2016.

International Workshops

- M. Ferro, C. R. Gaz, M. Vendittelli, "*A framework for sensorless identification of needle-tissue interaction forces in robot-assisted biopsies*", ICRA 2020 Workshop on Shared Autonomy: Learning and Control (SALC), Virtual conference, 2020.

- M. Ferro, G. A. Fontanelli, F. Ficuciello, B. Siciliano, M. Vendittelli. "*Vision-based suturing needle tracking with Extended Kalman Filter*". In 7th Joint Workshop on New Technologies for Computer/Robot Assisted Surgery (CRAS 2017), Montpellier, France, September 2017.

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