# Curriculum Vitae

	Personal Information
Name	Benigno Marco FANNI
Date of Birth	
Email	bmfanni@ftgm.it
	Education
Nov 2018 – Sept 2022	University of Pisa , Pisa, Italy
	PhD Degree in Information Engineering (Supervisor: Prof. Simona Celi), with period abroad at University College of London (London, United Kingdom), in collaboration with the Institute of Cardiovascular Science
Sept 2014 – Apr 2017	<ul> <li>University of Pisa , Pisa, Italy</li> <li>Master of Science in Biomedical Engineering</li> <li>(Supervisor: Prof. Simona Celi), with period abroad at University College of London (London, United Kingdom), in collaboration with the Institute of Cardiovascular Science</li> </ul>
Sep 2011 – Sept 2014	<b>University of Pisa</b> , <i>Pisa, Italy</i> Bachelor of Science in Biomedical Engineering
	Current Position
Jan 2018 – Present	BioCardioLab, Fondazione Monasterio Massa, Italy – Research engineer
	<ul> <li>Advanced image processing.</li> </ul>
	- Numerical simulation of patient-specific hemodynamics and cardiovascular procedures.
	<ul> <li>Additive manufacturing for medical and biomedical applications.</li> </ul>
	- Development of clinical simulators for cardiovascular interventions.
	- Development of mock loop circuits for cardiovascular fluid dynamics experiments.
	Current Projects – Role
Apr 2023 – Present	PLACE (An integrated pipeline for planning of Percutaneous Left Atrial Appendage Occlusion based on 3D printed and in-silico models) project – Research engineer
	<ul> <li>Elaboration of biomedical images.</li> </ul>
	– Advanced computational fluid dynamics simulation of left atrium.
	<ul> <li>Additive manufacturing of deformable left atrium models.</li> </ul>
	- Development of fluid-dynamics setups for hemodynamics investigation of the left atrial appendage.
	Past Projects – Role
May 2021 – May 2024	IMeC (In vivo Mechanical Characterization) project – Principal Investigator
	<ul> <li>Development of an image-based non-invasive framework for the patient-specific mechanical characterization of in-vivo vessels.</li> <li>Advanced processing of 2D and 3D phase contrast MRI.</li> </ul>
	<ul> <li>3D printing manufacturing of deformable vascular models.</li> </ul>
	<ul> <li>Development of MRI-compatible fluid-dynamics setups for the MRI acquisition of large vessels models.</li> </ul>
	Other Projects – Role
	<ul> <li>o Contribution to the DITAIDD project FF4EuroHPC (A digital twin for airflow and inhaled drug delivery in human airways) – Research engineer</li> <li>- Segmentation of biomedical images.</li> <li>- Numerical simulations of airflow in human airways.</li> </ul>

- o Contribution to the 4R Tender (Reviews on Non-animal Methods in Use for Biomedical Research) project – Research engineer
  - Investigation of non-animal methods for the research in the cardiovascular field.
  - Evaluation of engineering techniques for the replacement of animal experimentation.
  - o Winner of the competitive selection for the DIVINE (High-speed 3D-imaging of blood vessels based on optical signal processing) project Research engineer (2017-2019)
     Development of mechanical/microstructural setup for evaluation of cardiovascular tissues.
  - o Winner of the competitive selection for the VIVIR (Virtual and Augmented Reality Support for Transcatheter Valve Implantation by using Cardiovascular MRI) project
    - Research engineer (2017-2019)
    - Numerical simulations of cardiovascular structures in Finite Element environment.
    - Segmentation of biomedical images.
    - 3D printing manufacturing of heart structures models.
    - Development of fluid dynamic setup for evaluation of cardiovascular devices.

## Abroad Work Experiences

Apr 2019 – Gen 2020 Zayed Centre for Research into Rare Disease in Children, 20c, Guilford St, WC1N 1DZ London, United Kingdom

- Honorary Contract for visitor researcher during the abroad period for PhD research.

- Oct 2016 Dec 2016 Great Ormond Street Hospital, 30, Guilford St, WC1N 1EH London, United Kingdom
  - Honorary Contract for visitor student in the Institute of Cardiovascular Science (University College of London).

#### Awards

- Best Oral Presentation with the work "Study of left atrial appendage hemodynamics by integrating time-resolved CT and mesh morphing", presented at XIII Annual Meeting of the Italian Chapter of European Society of Biomechanics, October 3–4, 2024, Pescara, Italy.
- Scholarship selection with the work "Effect of uncertainties of image-based material properties of great vessels on vascular deformation", presented at ECCOMAS 2022, June 5–9, 2018, Oslo, Norway.
- Best Poster Presentation with the work "In-silico assessment of thrombosis risk: a CFD study of left atrial and left atrial appendage", presented at IX Annual Meeting of the Italian Chapter of European Society of Biomechanics, September 30—October 1, 2019, Bologna, Italy.
- Best Poster Presentation with the work "Importance of left atrium fluid dynamics for the planning of LAA closure procedure: an integrated computational fluid dynamics and morphological study", presented at European Society of Cardiology Conference, August 25–29, 2018, Munich, Germany.
  - Travel Grant with the work "Importance of left atrium fluid dynamics for the planning of LAA closure procedure: an integrated computational fluid dynamics and morphological study", presented at European Society of Cardiology Conference, August 25–29, 2018, Munich, Germany.

## Publications

#### Publications in International Journals as first author

- Fanni, B.M., Gasparotti, E., Esposito, A., Danielli, F., Berti, F., Berti, S., Pennati, G., Petrini, L. and Celi, S. A High-Fidelity Personalised 3D Printed Simulator for the Left Atrial Appendage Occlusion Procedure. (2024, October) *Rapid Prototyping Journal*. doi:10.1108/RPJ-03-2024-0126.
- [2] Geronzi, L., Fanni, B.M., De Jong, B., Roest, G., Kenjeres, S., Celi, S. and Biancolini, M.E. A Parametric 3D Model of Human Airways for Particle Drug Delivery and Deposition. (2024, January) *Fluids.* 9(1), 27. (Shared first autorship).
- [3] **Fanni, B.M.**, Gasparotti, E., Vignali, E., Capelli, C., Positano, V. and Celi, S. An integrated in-vitro and in-silico workflow to study the pulmonary bifurcation hemodynamics. (2023, April) *Computer and Fluids.* 260, 105912.

- [4] Fanni, B.M., Antonuccio, M.N., Pizzuto, A., Berti, S., Santoro, G. and Celi, S. Uncertainty quantification in the in vivo image-based estimation of local elastic properties of vascular walls. (2022, June) *Journal of Cardiovascular Development and Disease*. 10(109).
- [5] Fanni, B.M., Pizzuto, A., Santoro, G. and Celi, S. Introduction of a novel image-based and non-invasive method for the estimation of local elastic properties of great vessels. (2022, June) *Electronics*. 11(13), 2055.
- [6] Fanni, B.M., Sauvage, E., Celi, S., Norman, W., Vignali, E., Landini, L., Schievano, S., Positano, V. and Capelli, C. (2020, August). A proof of concept of a non-invasive image-based material characterization method for enhanced patient-specific computational modeling. *Cardiovascular Engineering and Technology*. 11, 532-543.
- [7] Fanni, B.M., Capellini, K., Di Leonardo, M., Clemente, A., Cerone, E., Berti, S. and Celi, S. (2020, February). Correlation between LAA morphological features and computational fluid dynamics analysis for non-valvular atrial fibrillation patients. *Applied Sciences*. 10(4), 1448.

Publications in International Journals as co-author

- Capellini, K., Ait-Ali, L., Vitali, P., Cantinotti, M., Murzi, M., Vignali, E., Fanni, B.M., Clemente, A., Celi, S. and Gasparotti, E., S. Three-dimensional printed models as an effective tool for the management of complex congenital heart disease. (2024, August) *Front. Bioeng. Biotechnol.*, 12, 1369514.
- [2] Gasparotti, E., Fanni, B.M., Del Pia, E., Danielli, F., Berti, F., Clemente, A., Berti, S., Pennati, G., Petrini, L. and Celi, S. Computational Fluid Dynamic Simulation to Evaluate the Device-Related Effects After Left Atrial Appendage Occlusion. (2024, April) Computer Methods in Biomechanics and Biomedical Engineering II. 39, 205-212.
- [3] Danielli, F., Berti, F., Fanni, B.M., Gasparotti, E., Fanni, B.M., Celi, S., Pennati, G. and Petrini, L. Left atrial appendage occlusion: On the need of a numerical model to simulate the implant procedure. (2024, March) *Numerical Methods in Biomedical Engineering*. 40(5), e3814.
- [4] Scalera, S., Clemente, A., Pizzuto, A., Gasparotti, E., Fanni, B.M., Vignali, E., Capellini, K., Celi, S. and Santoro, G. 3D printed model-guided neonatal transcatheter closure of left main coronary artery-to-right ventricle fistula. (2023, June) JACC: Case Reports. 16, 101869.
- [5] Antonuccio, M.N., Mariotti, A., Fanni, B.M., Capellini, K., Capelli, C., Sauvage, E. and Celi, S. (2021, August). Effects of uncertainty of outlet boundary conditions in a patient-specific case of aortic coarctation. *Annals of Biomedical Engineering*. 49(12), 3494-3507.
- [6] Celi, S., Gasparotti, E., Capellini, K., Vignali, E., Fanni, B.M., Ait-Ali, L., Cantinotti, M., Murzi, M., Berti., S. and Positano, V. (2021, June). 3D printing in modern cardiology. *Current Pharmaceutical Design.* 27(16), 1918-1930.
- [7] Capellini, K., Gasparotti, E., Cella, U., Costa, E., Fanni, B.M., Groth, C., Porziani, S., Biancolini, M.E. and Celi, S. (2021, May). A novel formulation for the study of the ascending aortic fluid dynamics with in vivo data. *Medical Engineering and Physics*. 91, 68-78.
- [8] Zaccaria, A., Danielli, F., Gasparotti, E., Fanni, B.M., Celi, S., Pennati, G. and Petrini, L. (2020, August). Left atrial appendage occlusion device: Development and validation of a finite element model. *Medical Engineering and Physics*. 82, 104-118.
- [9] Vignali, E., Gasparotti, E., Capellini, K., Fanni, B.M., Landini, L., Positano, V. and Celi, S. (2020, July). Modeling biomechanical interaction between soft tissue and soft robotic instruments: importance of constitutive anisotropic hyperelastic formulations. *International Journal of Robotics Research*. 40(1), 224-235.
- [10] Vignali, E., Gasparotti, E., Fanni, B.M., Ait-Ali, L., Positano, V., Landini, L. and Celi, S. (2020, March). Development of a fully controllable real-time pump to reproduce left ventricle physiological flow. *Proceedings of XXIV AIMETA Conference 2019*, Rome Lecture Notes in Mechanical Engineering. (pp. 908-919). Springer.

[11] Gasparotti, E., Vignali, E., Losi, P., Scatto, M., Fanni, B.M., Soldani, G., Landini, L., Positano, V. and Celi, S. (2018, December). A 3D printed melt-compounded antibiotic loaded thermoplastic polyurethane heart valve ring design: an integrated framework of experimental material tests and numerical simulations. *International Journal of Polymeric Materials and Polymeric Biomaterials*. 68(1-3), 1-10.

International and National Conferences/Workshops with Peer Review

- [1] Verdirame, I., Fanni, B.M., Buongiorno, R., Dell'Agnello, F., Petrini, L., Berti, S., Cademartiri, F., Parodi, G., Danielli, F., Berti, F., Pennati, G., Petrini, L. and Celi, S. (2024, October). Incorporation of computational fluid dynamics simulations into the treatment pipeline of complex congenital heart diseases using clinically available data: a case study. XIII Annual Meeting of the Italian Chapter of European Society of Biomechanics, Pescara.
- [2] Buongiorno, R., Verdirame, I., Fanni, B.M., Dell'Agnello, F., Capellini, K. and Celi, S. (2024, October). Incorporation of computational fluid dynamics simulations into the treatment pipeline of complex congenital heart diseases using clinically available data: a case study. XIII Annual Meeting of the Italian Chapter of European Society of Biomechanics, Pescara.
- [3] Cetatoiu, M.A., Fanni, B.M., Bonfanti, C., Bonfanti, S., Petrini, L., Santoro, G., Celi, S., Pennati, G. and Berti, F. (2024, September). Incorporation of computational fluid dynamics simulations into the treatment pipeline of complex congenital heart diseases using clinically available data: a case study. XXIII International Conference on Mechanics in Medicine and Biology – ICMMB, Bruxelles.
- [4] Danielli, F., Fanni, B.M., Gasparotti, E., Celi, S., Petrini, L., Pennati, G. and Berti, F. (2024, September). Left atrial appendage occlusion: a virtual model to simulate implant procedure in patient-specific scenarios. XXIII International Conference on Mechanics in Medicine and Biology – ICMMB, Bruxelles.
- [5] Danielli, F., Berti, F., Fanni, B.M., Gasparotti, E., Colella, A., Vitozzi, A., Celi, S., Pennati, G. and Petrini, L. (2024, September). Left atrial appendage occlusion: a virtual model to simulate implant procedure in patient-specific scenarios. *Virtual Physiological Human Conference 2024*, Stuttgart.
- [6] Fanni, B.M., Verdirame, I., Capellini, K., Dell'Agnello, F., Mazzoli, M., Garzia, S., Danielli, F., Berti, F., Pennati, G., Petrini, L. and Celi, S. (2024, July). An image-based in-silico pipeline for the patient-specific simulation of the left atrial hemodynamics. 29th Congress of the European Society of Biomechanics, Edinburgh.
- [7] Fanni, B.M., Verdirame, I., Capellini, K., Dell'Agnello, F., Mazzoli, M., Garzia, S., Danielli, F., Berti, F., Pennati, G., Petrini, L. and Celi, S. (2024, July). An image-based in-silico pipeline for the patient-specific simulation of the left atrial hemodynamics. 29th Congress of the European Society of Biomechanics, Edinburgh.
- [8] Fanni, B.M., Gasparotti, E., Esposito, A., Danielli, F., Berti, F., Berti, S. Pennati, G., Petrini, L. and Celi, S. (2024, July). Left atrial appendage occlusion: a 3D printed simulator for the patient-specific procedural planning and training. 29th Congress of the European Society of Biomechanics, Edinburgh.
- [9] Gasparotti, E., Fanni, B.M., Dell'Amico, M., Danielli, F., Berti, F., Pennati, G., Petrini, L. and Celi, S. (2024, July). Design and fabrication of deformable 3D printed model of patient-specific left atrium for PIV investigation. 29th Congress of the European Society of Biomechanics, Edinburgh.
- [10] Mazzoli, M., Fanni, B.M., Ait-Ali, L., Monteleone, A. and Celi, S. (2024, July). Augmented computational fluid dynamics for Tetralogy of Fallot patients evaluation. 29th Congress of the European Society of Biomechanics, Edinburgh.
- [11] Chestnutt, L., Fanni, B.M., Rettig, N., Schievano, S., Celi, S., Aggarwal, A. and Capelli, C. (2024, July). Patient-specific FE simulation of total cavopulmonary connection: procedure planning and device development. 29th Congress of the European Society of Biomechanics, Edinburgh.

- [12] Mazzoli, M., Fanni, B.M., Scarpolini, M.A., Dell'Agnello, F. and Celi, S. (2024, June). An integrated multi-imaging Al-based pipeline to study cardiovascular hemodynamic indices: aortic and pulmonary vessels case studies. *The 9th European Congress on Computational Methods in Applied Sciences and Engineering – ECCOMAS Congress 2024*, Lisbon.
- [13] Mazzoli, M., Scarpolini, M. A., Fanni, B.M., Capellini, K., Monteleone, A., Ait Ali, L. and Celi, S. (2023, October). An AI and Statistical Shape Analysis combined framework to extract features in complex cardiovascular structures. XXIV CONGRESSO SIRC, Imola.
- [14] Singh, J., Capellini, K., Fanni, B.M., Mariotti, A., Salvetti, M. V. and Celi, S. (2023, September). Numerical simulations to predict the onset of atherosclerotic plaques in carotid arteries. WECM'23 - 2nd Workshop on Experimental and Computational Mechanics, Pisa.
- [15] Mazzoli, M., Scarpolini, M.A., Fanni, B.M. and Celi, S. (2023, September). A statistical shape modeling framework to correlate morphology and hemodynamics of complex great vessels. XII Annual Meeting of the Italian Chapter of the European Society of Biomechanics, Turin.
- [16] Fanni, B.M., Gasparotti, E., Capellini, K., Danielli, F., Berti, F., Berti, S., Pennati, G., Petrini, L. and Celi, S. (2023, July). A numerical workflow to investigate the hemodynamics effects of the left atrial appendage occlusion. 28th Congress of the European Society of Biomechanics, Maastricht.
- [17] Mazzoli, M., Scarpolini, M.A., Fanni, B.M., Monteleone, A., Cademartiri, F. and Celi, S. (2023, July). A multi source statistical shape analysis framework for complex cardiovascular structures. 28th Congress of the European Society of Biomechanics, Maastricht.
- [18] Danielli, F., Berti, F., Fanni, B.M., Gasparotti, E., Celi, S., Pennati, G., and Petrini, L. (2023, July). On the need of a reliable numerical model to simulate the left atrial appendage occlusion: a finite element study. 28th Congress of the European Society of Biomechanics, Maastricht.
- [19] Gasparotti, E., Fanni, B.M., Capellini, K., Clemente, A., Berti, S. and Celi, S. (2023, May). Numerical simulations to evaluate the device-related effects in atrial fibrillation patients. 18th International Symposium on Computer Methods in Biomechanics and Biomedical Engineering, Paris.
- [20] Danielli, F., Fanni, B.M., Gasparotti, E., Petrini, L., Pennati, G. and Berti, F. (2023, May). A discussion on strategies for the in silico deployment of left atrial appendage occluders. 18th International Symposium on Computer Methods in Biomechanics and Biomedical Engineering, Paris.
- [21] Fanni, B.M., Pizzuto, A., Santoro, G. and Celi, S. (2023, April). A Comprehensive Numerical Workflow for the Image-Based Estimation of In-Vivo Vascular Wall Mechanical Properties. 22nd Computational Fluids Conference, Cannes.
- [22] Danielli, F., Berti, F., Fanni, B.M., Gasparotti, E., Pennati, G., Petrini, L. and Celi, S. (2022, October). A comprehensive study to develop a numerical model of the left atrial appendage occlusion. XI Annual Meeting of the Italian Chapter of the European Society of Biomechanics, Massa.
- [23] Mariotti, A., Antonuccio, M.N., Fanni, B.M., Morello, M., Salvetti, M.V. and Celi, S. (2022, October). CFD simulations and uncertainty quantification to investigate aorta coarctations. XI Annual Meeting of the Italian Chapter of the European Society of Biomechanics, Massa.
- [24] Fanni, B.M., Gasparotti, E., Capellini, K., Vignali, E., Santoro, G. and Celi, S. (2022, June). Image-based characterization of large vessels integrating in-vitro and in-silico methods. 27th Congress of the European Society of Biomechanics, Porto.
- [25] Capellini, K., Gasparotti, E., Vignali, E., Fanni, B.M., Scarpolini, M.A., Cademartiti, F., and Celi, S. (2022, June). Image-based in vivo estimation of aortic local stiffness and hemodynamics. 27th Congress of the European Society of Biomechanics, Porto.
- [26] Fanni, B.M., Antonuccio, M. N., Santoro, G. and Celi, S. (2022, July). An indirect and non-invasive methodology to assess patient-specific elastic properties of great vessels from magnetic resonance imaging. *9th World Congress of Biomechanics*, Taipei – Online.

- [27] Fanni, B.M., Capellini, K., Benvenuti, A., Berti, S. and Celi, S. (2022, July). Effects of pulmonary veins on the hemodynamics of the left atrial appendage: a computational fluid dynamics investigation. 9th World Congress of Biomechanics, Taipei – Online.
- [28] Capellini, K., Fanni, B.M., Del Pia, E., Berti, S. and Celi, S. (2022, July). Computational fluid dynamics evaluation of residual risk of thrombi formation after left atrial appendage occlusion. 9th World Congress of Biomechanics, Taipei – Online.
- [29] Fanni, B.M., Antonuccio, M.N., Santoro, G., Mariotti, A., Salvetti, M.V. and Celi, S. (2022, June). Effect of uncertainties of image-based material properties of great vessels on vascular deformation. The 8th European Congress on Computational Methods in Applied Sciences and Engineering ECCOMAS Congress 2022, Oslo.
- [30] Fanni, B.M., Gasparotti, E., Vignali, E., Capelli, C., Positano, V. and Celi, S. (2021, July). A parametric equation for the non-invasive estimation of the elastic properties of materials. 26th Congress of the European Society of Biomechanics, Milan – Online.
- [31] Fanni, B.M., Vignali, E., Gasparotti, E., Capelli, C., Positano, V. and Celi, S. (2021, July). An MRI-based patient-specific RCR estimation of pulmonary bifurcation using in-vitro and in-silico approaches. 26th Congress of the European Society of Biomechanics, Milan – Online.
- [32] Antonuccio, M.N., Perondi, S., Fanni, B.M., Capellini, K. and Celi, S. (2021, July). CFD/UQ integrated approach for patient-specific studies of aortic coarctation. 26th Congress of the European Society of Biomechanics, Milan – Online.
- [33] Danielli, F., Zaccaria, A., Stretti, E., Zaccone, M.F., Gasparotti, E., Fanni, B.M., Capellini, K., Celi, S., Pennati, G. and Petrini, L. (2021, July). In-silico modeling of the left atrial appendage occlusion: definition of a validated path. 26th Congress of the European Society of Biomechanics.
- [34] Capellini, K., Gasparotti, E., Vignali, E., Fanni, B.M., Cella, U., Costa, E., Biancolini, M.E. and Celi, S. (2021, July). An image-based CFD and RBF morphing approach: an alternative for standard FSI technique. 26th Congress of the European Society of Biomechanics.
- [35] Fanni, B.M., Vignali, E., Capelli, C., Positano, V. and Celi, S. (2021, May). An integrated in-vitro and in-silico workflow to study the pulmonary bifurcation hemodynamics. 32nd Parallel Computational Fluid Dynamics Conference, Nice – Online.
- [36] Zaccaria, A., Danielli, F., Gasparotti, E., Fanni, B.M., Migliavacca, F., Pennati, G., Celi, S. and Petrini, L. (2020, August). A validation path for a left atrial appendage occluder. *Virtual Physiological Human Conference 2020*, Paris.
- [37] Antonuccio, M.N., Mariotti, A., Salvetti, M.V., Fanni, B.M., Capellini, K., Savage, E., Capelli, C. and Celi, S. (2020, September). owards the translation of patient-specific CFD simulations into clinics: an integrated approach for a non-invasive study of aortic coarctation. *Virtual Physiological Human Conference 2020*, Paris.
- [38] Vignali, E., Gasparotti, E., Mariotti, A., Capellini, K., Haxhiademi, D., Bianchi, G., Fanni, B.M., Positano, V., Landini, L., Salvetti, M. V. and Celi, S. (2019, October). Development of a custom mock circulatory loop for in-vitro study of patient specific aortic branches. *International Society for Mechanical Circulatory Support*, Bologna.
- [39] Fanni, B.M., Capellini, K., Gasparotti, E., Vignali, E., Positano, V., Landini, Cerone, E., Berti, S. and Celi, S. (2019, October). L'in-silico e l'in-vitro per il planning clinico della procedura di chiusura percutanea dell'auricola sinistra. Italian Digital Biomanufacturing Network 3rd National Congress, Pisa.
- [40] Gasparotti, E., Vignali, E., Capellini, K., Haxhiademi, D., Bianchi, G., Fanni, B.M., Landini, L., Positano, V. and Celi, S. (2019, October). Sviluppo di un banco prova paziente specifico per lo studio in-vitro della fluidodinamica dell'arco aortico. *Italian Digital Biomanufacturing Network 3rd National Congress*, Pisa.
- [41] Fanni, B.M., Sauvage, E., Capellini, K., Landini, L., Positano, V., Capelli, C. and Celi, S. (2019, October). A corrected formulation for the image-based inferring of patient-specific material properties. *IX Annual Meeting of the Italian Chapter of the European Society of Biomechanics*, Bologna.

- [42] Capellini, K., Fanni, B.M., Gasparotti, E., Di Leonardo, M., Cerone, E., Positano, V., Landini, L., Berti, S. and Celi, S. (2019, October). In-silico assessment of thrombosis risk: a CFD study of left atrial and left atrial appendage. *IX Annual Meeting of the Italian Chapter* of the European Society of Biomechanics, Bologna.
- [43] Capellini, K., Cella, U., Costa, E., Gasparotti, E., Fanni, B.M., Biancolini, M. E. and Celi, S. (2019, October). A coupled CFD and RBF mesh morphing technique as surrogate for one-way FSI study. *IX Annual Meeting of the Italian Chapter of the European Society of Biomechanics*, Bologna.
- [44] Zaccaria, A., Gasparotti, E., Fanni, B.M., Migliavacca, F., Pennati, G., Petrini, L. and Celi, S. (2019, October). Finite element model of a left atrial appendage occlusion device. *IX Annual Meeting of the Italian Chapter of the European Society of Biomechanics*, Bologna.
- [45] Fanni, B.M., Sauvage, E., Capelli, C., Gasparotti, E., Vignali, E., Schievano, S., Landini, L., Positano, V. and Celi, S. (2019, September). A numerical and 3D printing framework for the in vivo mechanical assessment of patient-specific cardiovascular structures. 2nd International Conference on Simulation for Additive Manufacturing, Sim-AM 2019, Pavia. (pp. 31-39). International Centre for Numerical Methods in Engineering.
- [46] Antonuccio, M.N., Fanni, B.M., Capellini, K., Sauvage, E., Mariotti, A., Capelli, C. and Celi, S. (2019, September). An integrated approach of uncertainty quantification and 3D MRI techniques in guiding CFD analysis for a non-invasive study of aortic coarctation. Workshop on Frontiers of Uncertainty Quantification in Fluid Dynamics, Pisa.
- [47] Fanni, B.M., Sauvage, E., Celi, S., Landini, L., Schievano, S., Positano, V. and Capelli C. (2019, September). A modified formulation of the QA method for inferring materials properties for enhanced patient-specific computational models. *BioMedEng19 Conference*, London.
- [48] Fanni, B.M., Sauvage, E., Schievano, S., Landini, L., Celi, S., Positano, V. and Capelli C. (2019, July). Indirect evaluation of material properties of large blood vessels based on in silico and in vitro models. 25th Congress of the European Society of Biomechanics, Vienna.
- [49] Gasparotti, E., Cioffi, M., Positano, V., Vignali, E., Fanni, B.M., Capellini, K., Haxhiademi, D., Costa, E., Berti, S., Landini, L. and Celi, S. Analysis of alternative methods and models for research in cardiovascular disease. 2nd Centro. Vol. 3R Annual Meeting, Genova.
- [50] Fanni, B.M., Capelli, C., Capellini, K., Bianchini, E., Di Lascio, N., Landini, L. and Positano V. and Celi, S. (2018, November). 3D printed models for the mechanical characterization of cardiovascular structures. IDBN 2018 II Conference & III Thematic Conference ESB-ITA: 3D Printing and Biomechanics, Pavia.
- [51] Vignali, E., Gasparotti, E., Scatto, M., Losi, P., Fanni, B.M., Capellini, K., Landini, L., Positano, V. and Celi, S. (2018, November). 3D printing of an antibiotic-loaded heart valve ring prosthesis in thermoplastic polyurethane: fabrication, testing and simulation. *IDBN* 2018 – II Conference & III Thematic Conference ESB-ITA: 3D Printing and Biomechanics, Pavia.
- [52] Celi, S., Fanni, B.M., Gasparotti, E., Capellini, K., Vignali, E., Di Leonardo, M., Cerone, E., Pastormerlo, L.E., Paradossi, U., Positano, V., Landini, L. and Berti, S. (2018, November). A computational framework for personalized blood flow analysis and device implantation to optimize LAA closure procedure. *CSI Focus LAA 2018*, Frankfurt.
- [53] Fanni, B.M., Gasparotti, E., Faita, F., Di Lascio, N., Schievano, S., Landini, L., Celi, S., Positano, V. and Capelli, C. (2018, September). An integrated image-based framework for the mechanical characterization of patient-specific blood vessels. *Virtual Physiological Human Conference 2018*, Zaragoza.
- [54] Fanni, B.M., Gasparotti, E., Vignali, E., Capellini, K., Vivoli, G., Mariani, M., Landini, L., Positano, V., Celi, S. and Berti, S. (2018, August). Importance of left atrium fluid dynamics for the planning of LAA closure procedure: an integrated computational fluid dynamics and morphological study. *European Society of Cardiology Congress 2018*, Munich.

- [55] Fanni, B.M., Gasparotti, E., Faita, F., Di Lascio, N., Schievano, S., Landini, L., Celi, S., Positano, V. and Capelli, C. (2018, July). Image-based mechanical characterization of large blood vessels for patient-specific simulations. 8th World Congress of Biomechanics, Dublin.
- [56] Fanni, B.M., Gasparotti, E., Celi, S., Positano, V., Faita, F., Di Lascio, N., Landini, L., Schievano, S. and Capelli, C. (2017, September). Image-based mechanical characterization of large blood vessels. VII Annual Meeting of the Italian Chapter of the European Society of Biomechanics, Rome.

Other Research Contributions

- [1] Stretti, E., Zaccone, M.F, Zaccaria, A., Danielli, F., Gasparotti, E., Fanni, B.M., Capellini, K., Celi, S., Pennati, G. and Petrini, L. (2020, November). In-silico model of left atrial appendage occlusion: comparison with implantation in 3D printed patient specific geometry. *International CAE Conference 2019*, Vicenza.
- [2] Fanni, B.M., Gasparotti, E., Capellini, K., Capelli, C., Vignali, E., Positano, V. and Celi, S. (2019, October). A novel image-based formulation for enhanced patient-specific in silico simulations of cardiovascular structures. *International CAE Conference 2019*, Vicenza.
- [3] Antonuccio, M.N., Mariotti, A., Fanni, B.M., Capellini, K., Savauge, E., Capelli, C. and Celi, S. (2019, October). An integrated CFD and UQ approach to assess hemodynamic alteration in the aortic coarctation. *International CAE Conference 2019*, Vicenza.
- [4] Capellini, K., Cella, U., Costa, E., Gasparotti, E., Vignali, E., Fanni, B.M. and Celi, S. (2019, October). A novel FSI approach for the study of the aorta hemodynamics: an integrated imaged based and RBF mesh morphing technique. *International CAE Conference 2019*, Vicenza.
- [5] Danielli, F., Gjini, A., Zaccaria, A., Gasparotti, E., Fanni, B.M., Petrini, L., Celi, S. and Pennati, G. (2019, October). Numerical model of a left atrial appendage occluder. *International CAE Conference 2019*, Vicenza.
- [6] Fanni, B.M., Capellini, K. and Celi, S. (2019, September). Applicazione dell'uncertainty quantification in campo cardiovascolare: esempi con codice commerciale. *Workshop: Uncertainty Quantification in Modern Science*, Pisa.
- [7] Capellini, K., Fanni, B.M. and Celi, S. (2019, September). Applicazione dell'uncertainty quantification in campo cardiovascolare: esempi con codice open-source. *Workshop: Uncertainty Quantification in Modern Science*, Pisa.
- [8] Gasparotti, E., Vignali, E., Capellini, K., Fanni, B.M., Cerillo, A.G., Berti, S., Positano, V., Landini, L. and Celi, S. (2018, December). A healthcare digital twin using integrated imaging and finite element model: developing a pre-planning phase to improve the performances of a Cardioband procedure for the treatment of mitral regurgitation. *EnginSoft Newsletter: Simulation Based Engineering & Data Sciences, EnginSoft.*
- [9] Fanni, B.M., Celi, S., Vignali, E., Capellini, K., Schievano, S., Landini, L., Capelli, C. and Positano, V. (2018, October). A combined in silico and in vitro image-based approach for the mechanical characterization of patient-specific cardiovascular structures. *International CAE Conference 2018*, Vicenza.
- [10] Capellini, K., Fanni, B.M., Gasparotti, E., Vignali, E., Sabatino, D., Di Leonardo, M., Berti, S., Landini, Positano, V. and Celi, S. (2018, October). The role of simulations for LAA closure procedure: from planning to post-procedural analysis. *International CAE Conference* 2018, Vicenza.
- [11] Vignali, E., Gasparotti, E., Manigrasso, Z., Biffi, B., Capellini, K., Fanni, B.M., Schievano, S., Landini, L., Positano, V., Capelli, C. and Celi, S. (2018, October). A numerical and experimental approach for the design of a novel 3D printed bioinspired cardiac pneumatic pump. *International CAE Conference 2018*, Vicenza.
- [12] Fanni, B.M., Gasparotti, E., Celi, S., Positano, V., Faita, F., Di Lascio, N., Landini, L., Schievano, S. and Capelli, C. (2017, November). Image-based mechanical characterization of large blood vessels: a validated numerical study. *Regional User Meeting Simulia*, Milan.

# Additional Research Activities

- Supervisor of 14 Master thesis students in Biomedical Engineering at University of Pisa (2018-2024):
  - "A computational pipeline to evaluate the hemodynamic effect of the device positioning after left atrial appendage occlusion" (2024).
  - "Study of left atrial appendage hemodynamics: from AI-based image segmentation to moving-wall CDF simulations" (2024).
  - "Design and fabrication of 3D printed deformable model of patient-specific left atrium for PIV investigation" (2023).
  - "Analisi degli effetti delle vene polmonari sulla fluidodinamica dell'auricola sinistra mediante simulazioni numeriche agli elementi finiti" (2021).
  - "Quantificazione dell'incertezza delle proprietà meccaniche per analisi numeriche fluidostrutturali di grandi vasi" (2021).
  - "Caratterizzazione meccanica e funzionale dei materiali della stampante 3D Stratasys J750 Digital Anatomy per il settore vascolare" (2021).
  - "Studio degli effetti di procedura di chiusura dell'auricola sinistra tramite simulazioni di fluidodinamica computazionale" (2021).
  - "Study of a cohort of patients affected by Tetralogy of Fallot: an integrated approach between numerical simulation and experimental activities" (2020).
  - "Numerical investigation of a parametric model for the material characterization of great vessels" (2019).
  - "Towards the translation of patient-specific simulations into clinics: an integrated approach in guiding CFD analysis for a non-invasive study of aortic coarctation" (2019).
  - "Sviluppo di modelli in silico per l'analisi morfologica e funzionale dell'auricola sinistra mediante simulazioni numeriche CFD" (2018)
  - "Valutazione delle alterazioni fluidodinamiche dell'atrio destro mediante analisi computazionale" (2018).
  - "Unsupervised analysis of phase contrast MRI by maximally stable extremal region algorithm for patient-specific tissue characterization" (2018)
  - "Finite element simulation of the left atrial appendage closure procedure" (2018).
- **Member of the scientific committee** of the XIII Annual Meeting of the Italian Chapter of the European Society of Biomechanics, ESB-ITA 2024, 3–4 October 2024, Pescara.
- Member of the scientific committee of the IV Annual Congress of IDBN Italian Digital Biomanufacturing Network, IDBN 2024, 26–27 September 2024, Firenze.
- Invited Lecturer for the II Workshop on "Biomeccanica dei Trattamenti Endovascolari", held in Pavia on 9 May 2023, with the talk "Computational Modeling of Left Atrial Appendage Occluder".
- Lecturer for the Winter School "Big Data Analytics from Engineering to Clinics" in the context of the MeDiTATe project, 20-24 February 2023, with the talk "From imaging to mechanics".
- **Collaborator of Edwards Lifescience** for the development of a realistic simulator for the clinical training of the *mitral valve-in-valve transcatheter procedure*.
- **Organizer** of the mini-symposium "Mathematical and Computational Modelling of the Cardiovascular System" for the 22nd Computational Fluids Conference 2023.
- Collaborator of Ansys/LST R&D unit for the enhancement of LS-DYNA solver performance in the implementation of Windkessel boundary conditions for cardiovascular applications.
- **Member of the organizing committee** of the XI Annual Meeting of the Italian Chapter of the European Society of Biomechanics, ESB-ITA 2022, 6–7 October 2022, Massa.
- Lecturer for the LaBS seminar held at Politecnico di Milano with the presentation "A computational fluid dynamics workflow for the assessment of thromboembolic risk in non-valvular atrial fibrillation patients".

 Co-author of the JRC Technical Report "Reviews on Non-animal Methods in Use for Biomedical Research: Cardiovascular Diseases", in the context of the project 4R Tender funded by the EU Commission H2020 (JRC/IPR/2018/F.3/0035/OC).
 Reviewer for impacted scientific journals (Frontiers, Journal of Biomechanics, Scientific Reports, Journal of Engineering in Medicine).
 Lecturer for the course "Principles for Diagnostic Methods" at faculty of Biomedical Engineering, University of Pisa (2018-2022).
 Software Skills
 Numerical simulations Ansys Fluent, Ansys LS-DYNA, Abaqus, SimVascular
 Meshing ANSA, ICEM, gmsh, Meshmixer
 CAD Solidworks, Inventor, Fusion 360, FreeCAD
 Programming Matlab, Python, Android
 Imaging OsiriX, Horos, 3D Slicer, ITK-SNAP, Segment, vmtk, ImageJ, Arterys

## Italian Mothertongue

English Advanced – Academic IELTS C1 (2017)

28/10/2024

Date

Signature

In compliance with the Italian legislative Decree no. 196 dated 30/06/2003 and GDPR (EU Regulation 2016/679), I hereby authorize you to use and process my personal details contained in this document.