

Jorge Vicente Lopes da Silva – Scientific Researcher and Friend

There are texts that are easy to write and then there are others that have such an emotional significance that are much harder. I was invited to write about Jorge Vicente Lopes da Silva, a Brazilian researcher that had and continues to have a worldwide impact in the scientific, academic and industrial domain. He had a significant scientific contribution worldwide, but his greatest impact was the friendships that he created with everyone that had the opportunity of meeting him.

At the end of his career, he was the Director of Renato Archer Information Technology Center (CTI). He obtained his Ph.D. degree in Chemical Engineering, and MSc and BSc degrees in Electrical Engineering. He was a senior researcher of the Renato Archer Information Technology Center (CTI) since 1988, a Brazilian research centre from the Science, Technology, Innovation and Communications Ministry. He coordinated the Robotics Division at CTI for some years and in 1997 he created and coordinated the Tridimensional Technologies Research Group at the same centre, being a pioneer in this area in Brazil. Under his supervision the team developed applications and research projects with funding agencies, industry and universities in Brazil and abroad. He was a member of many scientific committees and invited speaker of many relevant conferences in the area of Additive Manufacturing. He was member of the editorial board and referee of dozens of journals. He was also a member of national and international research networks in the healthcare area like the Science and Technology National Institutes (INCT) for Biofabrication, INCT for Regenerative Medicine, and in the Brazilian Institute for Neuroscience and Neurotechnology (BRAINN). He also coordinated projects in the area of tissue engineering and healthcare with the most relevant Brazilian funding agencies like FINEP, FAPESP and CNPq and Ministry of Health. The laboratory that he created become involved in additive manufacturing, CAD and BioCAD modelling, medical imaging, and computer simulation for medical applications. He cooperated with more than 300 hospitals in Brazil and some others abroad. As a result of his work, computer tools were developed in special the software InVesalius for medical imaging, which are currently in use in 150 countries as an open-source solution. He cooperated with many universities supervising or co-supervising master and PhD thesis.

According to the Scopus platform, he published 163 documents that resulted in 2686 citations and an h-index of 27. Whereas according to ORCID, he published 154 documents and according to Frontiers Media SA he published 220 publications. The numbers are very notorious in spite of their variation between platforms, but his impact is much more relevant. He inspired researchers in both the academic and industrial community worldwide. For instance, he participated as a jury member in PhD defences worldwide, illustrating his significance and recognition within the scientific community.

Just to illustrate a slight glimpse and relevance of his work, the last papers that he published present the following abstracts:

- Recent advances in additive manufacturing (AM) offer transformative potential for designing and fabricating implantable medical devices. AM provides key advantages over traditional manufacturing, such as high customizability, the ability to create complex geometries, good dimensional accuracy, reduced material waste, and a cleaner production environment. Integrating structural design optimization (SDO) techniques, like Topology, Shape, and Size Optimization, with AM enhances device functionality and performance. Lattice structures and AI/ML applications further improve surface roughness, biocompatibility, and adaptability. Research focuses on reducing stress shielding, enhancing osseointegration, and personalizing implants. The review provides a detailed classification of optimization methods, with each approach scrutinized for its unique contribution to overcoming specific challenges in medical implant design, thus leading to more advanced, effective, and patient-oriented implantable devices (DOI: <https://doi.org/10.3389/fmech.2024.1353108>)

- Integration between the phases of computer-based guided dental implant surgery can be used to optimize oral rehabilitation. Two new surgical guides prepared by using the 3D metal and polymer printing technology are presented for immediate implant loading and definitive fixed prosthesis construction in flapless dental implant surgery. Nine implants and 2 fixed prostheses were installed in 2 completely edentulous adult patients by using a metalopolymer surgical guide with a metal central bar attached to a polymer seal or a metal guide. Virtual planning was used to design the 3D printed surgical guides, which were then constructed by using selective laser sintering (SLM) and selective laser melting (SLS). The 3D printed surgical guides oriented the surgical placement of the implants and were welded to the abutments and attached to the denture framework. The technique allowed implants and prostheses to be installed on the same day. DOI: <https://doi.org/10.1016/j.prosdent.2022.05.034>

From the abstracts presented above, it is possible to observe that not only he focused on the latest technologies and their advances and innovations but also focused on issues related to health in order to improve the well-being of everyone worldwide.

In spite of his departure, his research and publications will still serve as inspiration and reference for many years to come, contributing to the continuous growth of knowledge.

Besides his work and contributions, those that had the opportunity to meet him, had the opportunity to meet a joyful and friendly person always prompt to discuss any topic and assist and guide those who were willing to work in the field of additive manufacturing related to medical applications.

On his departure from, many were the kind words from researchers in several social media platform that he touched worldwide. For instance, Professor Paulo Bártolo, Director of the Singapore Centre for 3D Printing, Nanyang Technological University, states:

"Jorge was a fantastic person with impressive energy and a way of being that touched all of us in a special way. Jorge will remain with us, in our memories and in our thoughts."

In the academic field, writing a scientific paper is accessible when one has all the correct data, but in this case, writing about someone that had a significant impact in one's life in all domains, both scientific and personal, is much more meaningful. In summary, I'm especially grateful of having had the opportunity of knowing him. Not only did he aid my academic career but also, he was a dear friend.

"With your departure my dear friend, the world will be poorer for it."

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