

Curriculum Vitae

Guilherme Artur Conceição Capela

Guilherme Artur Conceição Capela is a Researcher at the Human-Centered Computing and Information Science Centre (HumanISE) of INESC TEC and holds an Integrated Master's Degree in Informatics and Computing Engineering from the Faculty of Engineering of the University of Porto (FEUP). He has nearly 20 years of experience in applied research, innovation, and consultancy, specialising in information systems engineering, interoperability, software architecture, digital platforms, and digital transformation.
Throughout his career, he has contributed to the specification, design, development, integration, and technical coordination of complex information systems supporting public administrations, territorial governance bodies, utilities, mobility operators, professional associations, and private organisations. His expertise spans requirements engineering, solution architecture, system integration, interoperability frameworks, data exchange platforms, geospatial information infrastructures, smart city ecosystems, and e-government solutions.
A significant part of his work has focused on enabling interoperability across heterogeneous systems through the design and implementation of APIs, web services, data integration platforms, and information-sharing architectures. He has also been involved in enterprise architecture, information systems modernisation, and digital transformation initiatives at organisational and inter-organisational levels.
His technical background further includes data processing, information retrieval, digital image analysis, Optical Character Recognition (OCR), Optical Music Recognition (OMR), and AI-enabled document management. He has authored and co-authored scientific publications in leading international venues, including IEEE Transactions on Pattern Analysis and Machine Intelligence and the International Journal on Document Analysis and Recognition (IJDAR).
Within European research and innovation activities, he participated in the Horizon 2020 project INCLUDING, contributing to the specification and development of virtual training authoring tools for radiological and nuclear preparedness scenarios. His research interests include interoperable information systems, digital platforms, decision-support environments, enterprise architecture, and data-driven solutions for complex organisational and societal challenges.

Identification

Personal identification

Full name
Guilherme Artur Conceição Capela

Gender
Male

Birth date
1983/03/28

Citation names

Capela, Artur

Author identifiers

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Websites

https://www.inesctec.pt/en/people/guilherme-artur-capela (Professional)

Knowledge fields

Engineering and Technology - Electrotechnical Engineering, Electronics and Informatics

Languages

Language	Speaking	Reading	Writing	Listening	Peer-review
Portuguese (Mother tongue)					
English	Intermediate (B1)	Advanced (C1)	Upper intermediate (B2)	Advanced (C1)	Intermediate (B1)

Education

	Degree	Classification
2007 - 2008 Concluded	Integrated Master in Informatics and Computing Engineering (Master's Degree) Major in Information Systems and Digital Platforms, Software Engineering, Web and Mobile Applications Universidade do Porto Faculdade de Engenharia, Portugal *"Reconhecimento de símbolos musicais manuscritos na framework Gamera / Handwritten Musical Symbol Recognition Using the Gamera Framework"* *(THESIS/DISSERTATION)*	14
2001 - 2007 Concluded	Bachelor's Degree in Informatics and Computing Engineering (Licenciate Degree) Universidade do Porto Faculdade de Engenharia, Portugal	14

	"Sistema automático de reconhecimento de pautas musicais manuscritas / Automatic Recognition System for Handwritten Music Scores" (THESIS/DISSERTATION)

Affiliation

Science

	Category Host institution/organization	Employer
2017/03/31 - Current	Contracted Researcher (Research) Instituto de Engenharia de Sistemas e Computadores Tecnologia e Ciência, Portugal	Instituto de Engenharia de Sistemas e Computadores Tecnologia e Ciência, Portugal
2009/12/03 - 2017/03/30	Researcher (Research)	Instituto de Engenharia de Sistemas e Computadores Tecnologia e Ciência, Portugal
2007/12/03 - 2008/12/02	Researcher (Research) Instituto de Engenharia de Sistemas e Computadores Tecnologia e Ciência, Portugal	Instituto Politécnico do Porto Escola Superior de Música e Artes do Espetáculo, Portugal

Others

	Category Host institution/organization	Employer
2008/09 - 2009/09	Information and Communication Technologies (ICT) Teacher	Externato do Centro de Caridade Nossa Senhora do Perpétuo Socorro, Portugal
2007/10/01 - 2008/03/01	Master's Thesis Researcher Instituto de Engenharia de Sistemas e Computadores Tecnologia e Ciência, Portugal	Universidade do Porto Faculdade de Engenharia, Portugal
2007/02/01 - 2007/09/01	Research Intern (Bachelor's Thesis Project) Instituto de Engenharia de Sistemas e Computadores Tecnologia e Ciência, Portugal	Universidade do Porto Faculdade de Engenharia, Portugal

Projects

Contract

	Designation	Funders
2022/10/01 - Current	AgendaTransform - Forestry Digital Transformation and Geospatial Information Platforms PN-PRR 34 Researcher Instituto de Engenharia de Sistemas e Computadores Tecnologia e Ciência, Portugal	Agência para a Competitividade e Inovação IP, Portugal Ongoing
2026/01/12 - 2027/01/31	PGU2CIMTSfollow - Smart City Platform and IoT Integration INESCP-SERV-13/26 Researcher	Comunidade Intermunicipal do Tâmega e Sousa, Portugal Ongoing
2026/01/09 - 2027/01/31	PGU2CIMTTMfollow - Smart City Platform and IoT Integration INESCP-SERV-14/26 Researcher	Comunidade Intermunicipal de Terras de Trás-os-Montes, Portugal Ongoing
2024/11/15 - 2026/11/30	eVoteTecTransf - Secure E-Voting Platform Technology Transfer INESCP-SERV-65/24 Researcher Instituto de Engenharia de Sistemas e Computadores Tecnologia e Ciência, Portugal	Xhockware, Portugal Ongoing
2025/07/28 - 2026/06/30	PGU2CIMTTM - Smart City Platform and IoT Integration INESCP-SERV-67/25 Researcher Instituto de Engenharia de Sistemas e Computadores Tecnologia e Ciência, Portugal	Comunidade Intermunicipal de Terras de Trás-os-Montes, Portugal Concluded
2025/04/01 - 2026/03/31	PGU2CIMTS - Smart City Platform and IoT Integration INESCP-SERV-20/25 Researcher Instituto de Engenharia de Sistemas e Computadores Tecnologia e Ciência, Portugal	Comunidade Intermunicipal do Tâmega e Sousa, Portugal Concluded

2024/09/02 - 2026/03/31	EYEFRYBluetooth - Food Oil Quality Monitoring Platform and Mobile Data Acquisition INESCP-SERV-26/24 Researcher Instituto de Engenharia de Sistemas e Computadores Tecnologia e Ciência, Portugal	Ambifood, Portugal Concluded
2022/09/15 - 2025/09/30	MAP3 - Smart Mobility Platform and Interoperability Consultancy INESCP-SERV-57/22 Researcher Instituto de Engenharia de Sistemas e Computadores Tecnologia e Ciência, Portugal	Quadrilátero Urbano, Portugal Concluded
2023/05/29 - 2023/10/28	eVote23 - Secure E-Voting Platform Enhancement and Integration INESCP-SERV-41/23 Researcher Instituto de Engenharia de Sistemas e Computadores Tecnologia e Ciência, Portugal	Ordem dos Arquitectos, Portugal Concluded
2021/07/10 - 2023/09/30	ARQNET3 - E-Government Platform Modernisation and Technical Consultancy INESCP-SERV-54/21 Researcher Instituto de Engenharia de Sistemas e Computadores Tecnologia e Ciência, Portugal	Ordem dos Arquitectos, Portugal Concluded
2021/09/01 - 2023/06/30	InOlive - Olive Tree Pest Detection and Monitoring System NORTE-01-0247-FEDER-072249 Researcher Instituto de Engenharia de Sistemas e Computadores Tecnologia e Ciência, Portugal	AI² – Agência para a Investigação e Inovação, E.P.E., Portugal Concluded
2021/04/03 - 2023/06/30	FLOREST@ - Forest Risk Assessment and Decision Support Platform NORTE-01-0247-FEDER-070301 Researcher Instituto de Engenharia de Sistemas e Computadores Tecnologia e Ciência, Portugal	AI² – Agência para a Investigação e Inovação, E.P.E., Portugal Concluded
2021/04/01 - 2023/06/30	SIGIPRO - AI-Enabled Document Management and Process Automation NORTE-01-0247-FEDER-069218 Researcher Instituto de Engenharia de Sistemas e Computadores Tecnologia e Ciência, Portugal	AI² – Agência para a Investigação e Inovação, E.P.E., Portugal Concluded

2020/09/01 - 2023/06/30	Regulam2ITSUrb - Traffic Enforcement Systems Regulation and Consultancy INESCP-SERV-34/20 Researcher Instituto de Engenharia de Sistemas e Computadores Tecnologia e Ciência, Portugal	Autoridade Nacional de Segurança Rodoviária, Portugal Concluded
2021/06/15 - 2022/03/31	Data4CiMob - Smart Mobility Interoperability Architecture and Data Integration INESCP-SERV-53/21 Researcher Instituto de Engenharia de Sistemas e Computadores Tecnologia e Ciência, Portugal	Quadrilátero Urbano, Portugal Concluded
2019/07/01 - 2021/12/31	INFRAVINI - Spatial Data Infrastructure and Decision Support for Viticulture NORTE-01-0247-FEDER-039739 Researcher Instituto de Engenharia de Sistemas e Computadores Tecnologia e Ciência, Portugal	AI² – Agência para a Investigação e Inovação, E.P.E., Portugal Concluded
2021/02/28 - 2021/06/25	MobData4Urb - Smart Mobility Platform Architecture and Data Integration INESCP-SERV-14/21 Researcher Instituto de Engenharia de Sistemas e Computadores Tecnologia e Ciência, Portugal	Quadrilátero Urbano, Portugal Concluded
2021/01 - 2021/06	INCLUDING - Virtual Training Authoring Tool for Radiological and Nuclear Scenarios 833573 Researcher Instituto de Engenharia de Sistemas e Computadores Tecnologia e Ciência, Portugal	Horizon 2020, Belgium Concluded
2020/04/15 - 2020/12/21	ARQNET2 - e-Government Platform, Interoperability and Electronic Voting INESCP-SERV-18/20 Researcher Instituto de Engenharia de Sistemas e Computadores Tecnologia e Ciência, Portugal	Ordem dos Arquitectos, Portugal Concluded
2020/01/27 - 2020/11/30	EYEFRYprototype2prod - Food Oil Quality Monitoring and Analytics Platform INESCP-SERV-28/20 Researcher Instituto de Engenharia de Sistemas e Computadores Tecnologia e Ciência, Portugal	Ambifood, Portugal Concluded

2018/09/20 - 2020/10/31	InteGrid - Smart Grid and Home Energy Management Platform 731218 Site InteGrid INESC TEC project page Researcher Instituto de Engenharia de Sistemas e Computadores Tecnologia e Ciência, Portugal	Horizon Europe, Belgium Concluded
2016/10/26 - 2020/06/30	ARQNET - e-Government Platform and Electronic Voting System INESCP-SERV-20/16 INESCP-SERV-18/20 Researcher Instituto de Engenharia de Sistemas e Computadores Tecnologia e Ciência, Portugal	Ordem dos Arquitectos, Portugal Concluded
2016/07/01 - 2019/05/22	IMOPORTAL - Logistics and Industrial Real Estate Platform INESCP-SERV 07/16 Researcher Instituto de Engenharia de Sistemas e Computadores Tecnologia e Ciência, Portugal	IMOFILTER, Portugal Concluded
2018/01/15 - 2018/12/31	EYEFRYPLUS - Food Oil Quality Monitoring and Analytics Platform INESCP-SERV-23/18 Researcher Instituto de Engenharia de Sistemas e Computadores Tecnologia e Ciência, Portugal	Ambifood, Portugal Concluded
2013/06/17 - 2017/12/31	PWA - Logistics and Industrial Real Estate Platform INESCP-SERV-47/13 Researcher Instituto de Engenharia de Sistemas e Computadores Tecnologia e Ciência, Portugal	IMOFILTER, Portugal Concluded
2015/05/01 - 2016/12/31	RTE - Enterprise Architecture Assessment and Transformation Roadmap Fábrica RTE Research Fellow Instituto de Engenharia de Sistemas e Computadores Tecnologia e Ciência, Portugal	RTE, SA, Portugal Concluded
2014 - 2015/06/30	IPMAPS - Spatial Data Infrastructure and Geospatial Services Platform IPMAPS (IPBrick) Research Fellow Instituto de Engenharia de Sistemas e Computadores Tecnologia e Ciência, Portugal	IPBrick, Portugal Concluded

2013 - 2014/03/31	MIELE - Large-Scale Logistics and Freight Management Platform INESCP-SERV-22/11 Research Fellow Instituto de Engenharia de Sistemas e Computadores Tecnologia e Ciência, Portugal	Other, Oman Concluded
2011/02/01 - 2013/05/31	ECOPLANNER - Eco-Efficiency Management and Monitoring Platform FCOMP-01-0202-FEDER-013085 Research Fellow Instituto de Engenharia de Sistemas e Computadores Tecnologia e Ciência, Portugal	Fundo Europeu do Desenvolvimento Regional, Portugal Concluded
2010 - 2012/12/31	GENERG - Enterprise Architecture Assessment and Transformation Roadmap INESCP-SERV-52/09 Research Fellow Instituto de Engenharia de Sistemas e Computadores Tecnologia e Ciência, Portugal	GENERG, Portugal Concluded
2009/05/30 - 2012/02/28	MOBILES - Electric Mobility Management Platform FCOMP-01-0202-FEDER005730 Research Fellow Instituto de Engenharia de Sistemas e Computadores Tecnologia e Ciência, Portugal	Fundo Europeu do Desenvolvimento Regional, Portugal Concluded
2007 - 2008	OMR - Optical Music Recognition for Handwritten Scores PTDC/EIA/71225/2006 Research Fellow Instituto Politécnico do Porto Escola Superior de Música e Artes do Espetáculo, Portugal	Fundação para a Ciência e a Tecnologia, Portugal Concluded

Outputs

Publications

Conference paper

1 Carlos Guedes; Jaime Cardoso; Guilherme Artur Capela; Ana Maria Rebelo; Cardoso, Jaime S.; Capela, Artur; Rebelo, Ana; Guedes, Carlos; Capela, Guilherme. "A Connected Path Approach for Staff Detection on a Music Score". 2008.
10.1109/ICIP.2008.4711927

2 Capela, Artur; Cardoso, Jaime S.; Rebelo, Ana; Guedes, Carlos; Guilherme Artur Capela; Carlos Guedes; Jaime Cardoso; Ana Maria Rebelo. "Integrated Recognition System for Music Scores". 2008.

	3	Ana Maria Rebelo; Carlos Guedes; Jaime Cardoso; Guilherme Artur Capela; Capela, Artur; Rebelo, Ana; Cardoso, Jaime S.; Guedes, Carlos. "Staff Line Detection and Removal with Stable Paths". 2008.
	4	Jaime Cardoso; Joaquim Pinto da Costa; Ana Maria Rebelo; Carlos Guedes; Guilherme Artur Capela; Eurico Carrapatoso. "A Shortest Path Approach for Staff Line Detection". 2007.
Journal article	1	Rebelo, A.; Capela, G.; Cardoso, Jaime S.. "Optical recognition of music symbols". *International Journal on Document Analysis and Recognition (IJDAR)* 13 1 (2009): 19-31. http://dx.doi.org/10.1007/s10032-009-0100-1. 10.1007/s10032-009-0100-1
	2	Capela, Artur; dos Santos Cardoso, J.; Capela, A.; Rebelo, A.; Guedes, C.; Pinto da Costa, J.. "Staff Detection with Stable Paths". *IEEE Transactions on Pattern Analysis & Machine Intelligence* 31 6 (2009): 1134-1139. http://doi.ieeecomputersociety.org/10.1109/TPAMI.2009.34. Published • 10.1109/TPAMI.2009.34
Thesis / Dissertation	1	Capela, Guilherme Artur Conceição. "Reconhecimento de símbolos musicais manuscritos na Framework Gamera". Master, Universidade do Porto Faculdade de Engenharia, 2008. http://hdl.handle.net/10216/58942.

Activities

Event participation

	Activity description Type of event	Event name Institution / Organization
2008/07/26 - 2008/07/29	Presentation and dissemination of research results at the International Conference on Signal Processing and Multimedia Applications (SIGMAP 2008) Conference	International Conference on Signal Processing and Multimedia Applications (SIGMAP 2008) Instituto de Engenharia de Sistemas e Computadores Tecnologia e Ciência, Portugal

Consulting

	Activity description	Institution / Organization
2022/09/15 - Current	MAP3 - Provision of technical consultancy services for the public procurement, specification, and implementation monitoring of the Minho Access Point (MAP), a regional mobility data platform. Activities included technical assessment, requirements analysis, stakeholder support, and oversight of the platform development process, contributing to the integration of mobility data and	Instituto de Engenharia de Sistemas e Computadores Tecnologia e Ciência, Portugal

	services across multiple municipalities and transport stakeholders. Client: Quadrilátero Urbano. Sector: Smart Cities > Mobility	
2026/01/12 - 2027/01/31	PGU2CIMTSfollow - Scientific and technological consultancy services to support the implementation of IoT solutions and an Urban Management Platform, in line with the framework and requirements established by the National Smart Territories Strategy (ENTI), with the objective of deploying a unified urban management platform across the eleven municipalities of the Tâmega e Sousa Intermunicipal Community, while ensuring the integration of existing vertical systems and the specification of new smart city services. Client: CIM-TS. Sector: Smart Cities	Instituto de Engenharia de Sistemas e Computadores Tecnologia e Ciência, Portugal
2026/01/09 - 2027/01/31	PGU2CIMTTMfollow - Scientific and technological consultancy services to support the implementation of IoT solutions and an Urban Management Platform, in line with the framework and requirements established by the National Smart Territories Strategy (ENTI), with the objective of deploying a unified urban management platform across the nine municipalities of the Terras de Trás-os-Montes Intermunicipal Community, while ensuring the integration of existing vertical systems and the specification of new smart city services. Client:CIM-TTM. Sec:Smart Cities	Instituto de Engenharia de Sistemas e Computadores Tecnologia e Ciência, Portugal
2025/07/28 - 2026/06/30	PGU2CIMTTM - The Intermunicipal Community of Terras de Trás-os-Montes (CIM-TTM) launched an initiative to implement an Urban Management Platform (UMP) supported by the integration of multiple information systems and smart city services. The project involved the interoperability of existing municipal vertical solutions and the incorporation of new digital services, enabling the creation of a unified platform for urban management, data integration, and smart territory governance across the municipalities of the region. Client:CIM-TTM. Sec:Smart Cities	Instituto de Engenharia de Sistemas e Computadores Tecnologia e Ciência, Portugal
2025/04/01 - 2026/03/31	PGU2CIMTS - Implementation of an Urban Management Platform (UMP) for the Intermunicipal Community of Tâmega e Sousa (CIM-TS), including the	Instituto de Engenharia de Sistemas e Computadores Tecnologia e Ciência, Portugal

	integration of multiple municipal information systems and smart city services. The project involved the interoperability of existing vertical solutions and the incorporation of new digital services, enabling the creation of a unified platform for urban management, data integration, and smart territory governance across the region. Client: CIM-TS. Sector: Smart Cities	
2021/07/10 - 2023/09/30	ARQNET3 - Provision of services related to the assessment and analysis of the solutions implemented within the e-Government platform of the Portuguese Order of Architects, as well as technical consultancy for the development of the new digital platform of the Order and technical oversight of its implementation. Client: Portuguese Order of Architects. Sector: Professional Associations	Instituto de Engenharia de Sistemas e Computadores Tecnologia e Ciência, Portugal
2020/09/01 - 2023/06/30	Regulam2ITSUrb - Specialised consultancy services for the Central State Administration in the field of Information Systems, involving market analysis and the preparation of regulations and approval manuals for equipment used in the detection of road traffic offences. Client: National Road Safety Authority (ANSR). Sector: Road Safety	Instituto de Engenharia de Sistemas e Computadores Tecnologia e Ciência, Portugal
2021/06/15 - 2022/03/31	Data4CiMob - Study and coordination of harmonised interoperability mechanisms for the mobility services of the Minho Access Point platform. Client: Quadrilátero Urbano. Sector: Smart Cities > Mobility	Instituto de Engenharia de Sistemas e Computadores Tecnologia e Ciência, Portugal
2021/02/28 - 2021/06/25	MobData4Urb - Definition of the Application Architecture for the Minho Access Point (mobility data repository), taking into account the various mobility services and mobility-related data/information available across the municipalities of the Quadrilátero Urbano (Barcelos, Braga, Guimarães and Vila Nova de Famalicão). Client: Quadrilátero Urbano. Sector: Smart Cities > Mobility	Instituto de Engenharia de Sistemas e Computadores Tecnologia e Ciência, Portugal
2015/05/01 - 2016/12/31	RTE-SI - Specialised consultancy in Information Systems aimed at identifying the limitations and constraints of Information Technologies within RTE - Pinturas e Montagens Industriais, Lda., assessing the suitability	Instituto de Engenharia de Sistemas e Computadores Tecnologia e Ciência, Portugal

	of the organisation's Information System in addressing current business requirements and emerging challenges, evaluating the adequacy of the IT team, and defining both current and future requirements. Client: RTE - Pinturas e Montagens Industriais, Lda. Sector: Industry > Bicycle Manufacturing and Assembly	
2010 - 2012/12/31	Generg-SI - Strategic consultancy in Information Systems for GENERG, based on the assessment of the company's Enterprise Architecture. The project involved the analysis of the current state and the definition of future perspectives, including the characterisation of software applications and the identification and modelling of GENERG's business processes. Sector: Energy	Instituto de Engenharia de Sistemas e Computadores Tecnologia e Ciência, Portugal