

## CURRICULUM VITAE ABREVIADO (CVA)

### Part A. PERSONAL INFORMATION

First name	Núria		
Family name	Forcada		
Gender (*)	Female	Birth date (dd/mm/yyyy)	15/05/1976
ID number	45482617W		
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#### A.1. Current position

Position	Full profesor		
Initial date	September 2022		
Institution	Universitat Politècnica de Catalunya		
Department/Center	Department of Project and Construction Engineering		
Country	Spain	Teleph. number	661616532
Key words	Decarbonization, digitalization, circularity, energy efficiency, building performance.		

#### A.2. Previous positions

Period	Position/Institution/Country/Interruption cause
2011-2021	Assistant professor (Profesora Agregada)/ UPC/ Spain
2005-2010	Associate professor (Profesora Colaboradora)/ UPC/ Spain
2003-2004	Associate professor (Profesora Colaboradora) / Universitat de Girona/ Spain

#### A.3. Education

PhD, Licensed, Graduate	University/Country	Year
Doctor in Construction engineering	Universitat Politècnica de Catalunya	2005
Industrial engineering	Universitat Politècnica de Catalunya	2000

### Part B. CV SUMMARY

Prof. Forcada is a member of the Group of Construction Research and Innovation (GRIC) from the Department of Project and Construction Engineering at the Universitat Politècnica de Catalunya (UPC). Dr. Forcada has a MSc in Industrial Engineering and an international PhD in Construction Engineering from the UPC.

The **scientific contribution** of Prof. Forcada includes the participation of 17 national and 8 international research projects funded by the European Union and the Spanish research council as well as the coordination of two of them. She also leads the UPC-Construcția Chair "Hub of circular economy applied to construction and industry" (120.000€) (2021-2025) which aims to promote knowledge and innovation in the field of circular economy in the construction sector and the associated industry.

Prof. Forcada has participated in several projects linked to digitalisation, automatization, and circularity such as the "N2B2 - Neural Networks for Boiler Behaviour" project (2022-2024), the "Implementation of a predictive control algorithm for the optimization of the heating and cooling systems of tertiary buildings" project (2022-2023), the "DigTwins4buildings - Human-centric digital twins for building

management” project (2022), the “Development of advanced holistic models for the circular construction” (2023-2026), the WEF4Build: Boosting buildings climate resilience through water-food-energy nexus-based solutions (2024-2026) and the “BINA FET- Building-integrated agriculture for an effective ecological transition: Modelling and implementation” project (2022-2024), the “Reducing nanoparticle exposures in industrial workplaces” project (2022-2024).

The results of her scientific work have been published in JCR indexed journals. Prof. Forcada co-authored **65 internationally refereed research papers published in JCR indexed journals** of which 39 in Q1 and 16 in Q2. She has a total of **2407 citations** and an **h-index of 29**.

From the results of her research, she has published the book “Integrated Building Intelligence” (2024), Springer and the book chapter “Digital twin for construction industry” within the book “Digital Twin and Blockchain for Sensor Networks in Smart Cities”, 1st Edition, Elsevier, (2025).

She has also organized the international conference “**IV Circular Construction Summit, Living in a material world. enabling systemic action: resources, nature, people (2024)**” which brought together researchers, industry leaders, policymakers, and practitioners to explore innovative strategies for: reducing material waste, enhancing resource efficiency, protecting natural ecosystems and prioritizing the well-being of people within the construction sector. This event underscored the importance of connecting stakeholders across disciplines to collectively tackle the challenges of sustainable development in the construction industry.

The **contributions to the society** of prof. Forcada include being the principal investigator of the Collaborative Joint Venture funding with Industry “Development of advanced holistic models for circular construction” 18.000€ (2023-2025). She has also been the principal investigator of the Collaborative Joint Venture funding with Industry “Circular economy knowledge management” 8.500€ (2021) and “Digitalization of the material passports of a construction company”, (2022) 8.500€.

The **contribution to the training to young researchers** includes the supervision of six theses. One of her PhD students (2013) is now a member of the GRIC. Another one (2019) obtained the Extraordinary Doctorate Award in the field of Civil and Environmental Engineering. One is currently under the Industrial Doctoral program within the Construcía company.

Prof. Forcada has supervised more than 150 master's theses in the field of digitalisation, circularity, building performance, energy efficiency and decarbonisation.

## **Part C. RELEVANT MERITS**

### **C.1. Publications**

- [1] Sahebzamani, E.; Forcada, N. (2025) **Enhancing sustainable construction decisions: integrating BIM and VR for circular economy assessment**, Building Research and Information <doi.org/10.1080/09613218.2024.2449441>.
- [2] Alavi, H.; Gordo, P.; Forcada, N.; Bayramova, A.; Edwards, D. J. (2024) **AI-driven BIM integration for optimizing healthcare facility design**, Buildings Vol. 14 num. 8, 2354 <10.3390/buildings14082354>.
- [3] Vergés, R.; Gaspar, K.; Forcada, N. (2024) **Predictive modelling of cooling consumption in nursing homes using artificial neural networks: implications for energy efficiency and thermal comfort**, Energy reports, Vol. 12 p. 2356-2372 <10.1016/j.egy.2024.08.029>
- [4] N. Forcada (2025) **Digital Twin and Blockchain for Sensor Networks in Smart Cities, Chapter 11. Digital twin for construction industry**, 1st Edition, Elsevier, Editor: Tuan Anh Nguyen, ISBN: 9780443300769

- [5] Alavi, H.; Kookalani, S.; Rahimian, F.; Forcada, N. (2024) **Integrated Building Intelligence**, Springer <10.1007/978-3-031-68865-2>
- [6] Vergés, R., Gaspar, K., Forcada, N. (2023) **Assessment of the energy implications adopting adaptive thermal comfort models during the cooling season: A case study for Mediterranean nursing homes**, Energy and Buildings, <doi: 10.1016/j.enbuild.2023.113598>
- [7] Bortolini, R.; Rodrigues, R.; Alavi, H.; Dalla Vecchia, L.; Forcada, N. (2022) **Digital twins' applications for building energy efficiency: a review**, Energies, Vol. 15 num. 19 p. 7002:1-7002:17 <10.3390/en15197002>.
- [8] Alavi, H.; Forcada, N.; Bortolini, R.; Edwards, D. J.(2021) **Enhancing occupants' comfort through BIM-based probabilistic approach**, Automation in construction, 123: 103528/1-103528/14 < doi.org/10.1016/j.autcon.2020.103528>.
- [9] Alavi H. Bortolini R., Forcada N. (2021) **BIM-based decision support system for building condition assessment**, Automation in Construction, 104117 <doi.org/10.1016/j.autcon.2021.104117>
- [10] Gangoellés, M.; Casals, M.; Macarulla, M.; Forcada, N., (2021) **Exploring the potential of a gamified approach to reduce energy use and carbon emissions in the household sector**, Sustainability, 13(6), p. 3380:1-3380:18 <doi.org/10.3390/su13063380>
- [11] Gangoellés, M., Gaspar, K., Casals, M., Ferré-Bigorra, J., Forcada, N., Macarulla, M. (2020) **Life-cycle environmental and cost-effective energy retrofitting solutions for office stock**, Sustainable Cities and Society, <DOI: 10.1016/j.scs.2020.102319>
- [12] Gangoellés, M., Casals, M., Ferré-Bigorra, J., Forcada, N., Macarulla, M., Gaspar, K., Tejedor, B. (2020) **Office representatives for cost-optimal energy retrofitting analysis: A novel approach using cluster analysis of energy performance certificate databases**, Energy and Buildings < DOI: 10.1016/j.enbuild.2019.109557>
- [13] Bortolini, R., Forcada, N. (2020) **Analysis of building maintenance requests using a text mining approach: building services evaluation**, Building Research & Information < DOI: 10.1080/09613218.2019.1609291>
- [14] Gangoellés, M.; Casals, M.; Forcada, N.; Macarulla, M. (2020) **Life cycle analysis of a game-based solution for domestic energy saving**, Sustainability, 12(17): 66:1-66:18 < doi.org/10.3390/su12176699>.
- [15] Casals, M.; Gangoellés, M.; Macarulla, M.; Forcada, N.; Fuertes, A.; Jones, R., (2020) **Assessing the effectiveness of gamification in reducing domestic energy consumption: lessons learned from the EnerGAware project**, Energy and buildings, 210, 109753:1-109753:12 <doi: 10.1016/j.enbuild.2019.109753>.
- [16] Bortolini, R., and Forcada, N. (2019) **A probabilistic-based approach to support the comfort performance assessment of existing buildings**, Journal of cleaner production, 237 <doi:10.1016/j.jclepro.2019.117720>.

## C.2. Congress

- [1] Forcada, N.; **IV Circular Construction Summit, Living in a material world. enabling systemic action: resources, nature, people**, 29 November 2024, La Pedrera, Barcelona. Organiser.
- [2] Forcada, N.; **IV Circular Construction Summit, Living in a material world. Enabling systemic action: resources, nature, people, Moderator of the session: Active Carbon Management**, Panel members: **Mariano García**, Sustainability Director – **Holcim**, **Areti Markopoulou**, Academic Director – **IAAC**, **Pablo Maroto**, Technisian & Marketing Director – **Knauf Ibérica**, 29 November 2024, La Pedrera, Barcelona, Invited conference.
- [3] Vergés, R.; Gaspar, K.; Font, D.; Forcada, N. 2024, **A Holistic Framework Proposal for Circular Construction from current trends, system needs, and sustainable objectives**, FTAL Circular Economy conference, Lugano, 14-15 November 2024, Hosted

by the Department of Innovative Technologies (DTI) of the University of Applied Sciences and Arts of Southern Switzerland (SUPSI). Best poster award.

- [4] Hosseini, M.R; Ahmadi, M; Elghaish, F; Forcada N; Fitriani, H; 2024, **Assessing Circularity Initiatives for Lowering Embodied Carbon in Australian Houses**, International Conference of Smart and Sustainable Built Environment (SASBE) | 7-9 November 2024 Scopus-Indexed Proceedings. Oral presentation.
- [5] Sahebzamani, E.; Forcada, N.; Lendinez, F. 2023, **An integrated framework for engaging stakeholders in the circular economy processes using BIM and VR**, International Conference on Circular Built Environment, p. 774-779. Best paper award.
- [6] Chumbiray, I-N.; Sahebzamani, E.; Lendinez, F.; Forcada, N. 2022, **Circular economy and digital twins in the construction sector**, International Congress on Project Management and Engineering, Terrassa, Spain, p. 444-456. Oral presentation.
- [7] Alavi, H.; Forcada, N.; Fan, S.; San, W. 2021, **BIM-based Augmented Reality for Facility Maintenance Management**, European Conference on Computing in Construction, p. 431-438 <doi: 10.35490/EC3.2021.180>. Oral presentation.

### C.3. Research projects

- [1] **WEF4Build: Boosting buildings climate resilience through water-food-energy nexus-based solutions** (2024-2026), IP: Miquel Casals, funded by AGAUR, (350,430 €).
- [2] **Development of advanced holistic models for the circular construction** (2023-2026), IP: Núria Forcada, funded by AGAUR (37,800 €)
- [3] **N2B2: Neural Networks for Boiler Behaviour (2022-2024)**, IP: Dr. Miquel Casals (UPC), Funded by: AGAUR (99,932.65 €).
- [4] **DigTwins4buildings: Human-centric digital twins for building management (2022-2024)**, IP: Dra. Rafaela Bortolini, Funded by FAPERGS (30.000€).
- [5] **Life Nanohealth: Reducing nanoparticle exposures in industrial workplaces (2022-2024)**, IP: Eva Vaquer from Asociación de Investigación de las Industrias Cerámicas (ITC-AICE), Funded by LIFE20 ENV/ES/000187, Life program (1.553.563 €).
- [6] **BINAFET: Building-integrated agriculture for an effective ecological transition: Modeling and implementation (2022-2024)**, IP: Dr. Santiago Gassó (UPC), funded by the spanish Ministry of Science, Innovation and Universities, (149,500€).
- [7] **Thecoelen – Implications of indoor thermal comfort in elderly on energy consumption (2020-2023)**, IP: Dr. Núria Forcada, Funded by: Min. de Economía, Industria y Competitividad (Programa Retos) (63.525€).
- [8] **Análisis del confort térmico en residencias de ancianos en el espacio de cooperación transfronterizo de España-Portugal (2018-2020)**. IP: Dr. Núria Forcada, Funded by: Fondo Europeo de Desarrollo Regional, Programa de Cooperación Interreg V-A España – Portugal, (POCTEP) 2014-2020 (100.000 €).

### C.4. Contracts, technological or transfer merits

- [1] **UPC-Construcía Chair “Hub of circular economy applied to construction and industry” (2021-2025)**, Director: Dr. Núria Forcada (120.000€).
- [2] **Development of advanced holistic models for circular construction (2023-2025)** IP: Dr. Núria Forcada, funded by: Grupo Construcía 18.000€.
- [3] **Digitalization of the material passports of a construction company (2022)**, IP: Dr. Núria Forcada, funded by: Grupo Construcía (8.500€).

- [4] **Circular economy knowledge management (2021)**, IP: Dr. Núria Forcada, funded by: Grupo Construcía (8.500€).