

Dr Maite Frutos-Pascual

Senior Lecturer (FHEA) , DMT Lab, Birmingham City University (United Kingdom)

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PERSONAL PROFILE

With over ten years experience in emerging technologies and extended reality, Maite specializes in immersive technologies (AR/VR), Human Computer Interaction (HCI), usability, interactive systems and sensor data analysis and integration. Her recent work has focused on User Interface (UI) design and interaction techniques in mixed AR/VR using hand tracking, sensor systems and user experience analysis. She has a strong AR/VR background supported by an ample list of relevant publications (including award-winning contributions) in leading conferences in the field. Maite has extensive experience working in funded innovative industry projects both nationally and internationally. She has been involved in the supervision and development of several industry projects linking fundamental AR/VR interaction research performed at BCU with industry applications involving immersive technologies in a variety of disciplines from clothing and retail to healthcare.

EDUCATION

2012 - 2016	PhD in Computer Science and Telecommunications Engineering, <i>Cum Laude</i> - Ignacio Ellacuria Best PhD Award 2016/2017 University of Deusto, Bilbao, Spain Thesis title: <i>"Multi Variable Analysis of Gaze and Interaction for Real Time Player Profiling in Cognitive Intelligent Therapies based on Serious Games"</i>
2011 - 2012	MSc in Software Development and Integration University of Deusto, Bilbao, Spain
2006 - 2011	Bachelor of Engineering, Telecommunications Engineering (5 years) University of Deusto, Bilbao, Spain
2010 - 2011	Vision, Graphics and Interactive Systems (VGIS) Aalborg Universitet, Aalborg, Denmark
2006 - 2009	Bachelor of Engineering, Technical Engineering in Telecommunications, speciality in Telematics (3 years) University of Deusto, Bilbao, Spain

RESEARCH AND PROFESSIONAL EXPERIENCE

May 2020 -
to present

Senior Lecturer, School of Computing and Digital Technology, Birmingham City University, Birmingham, United Kingdom

(Dec 2021 - Dec 2022 -
Maternity Leave)

- PhD Supervision (current: 1 as Director of Studies, 3 as co-supervisor/second supervisor, 4 completions)
- Cluster lead for Immersive Technologies (AR/VR) within the HCI Group
- Output and research contribution lead at DMT Lab
- Leading submissions for bids and project proposals (InnovateUK KTP)
- Aurora Advance HE's leadership development initiative for women
- Innovate UK Immersive Tech Network - Academic working group
- Conference committees (IEEE ISMAR, IEEE VR, ACM VRST)
- Innovate UK KTP Supervision
- Teaching and module leading (MSc and BSc levels)
- Dissemination of research findings (CHI, Interact, VRST, ISMAR, and others)

Nov. 2018 -
May 2020

Lecturer in Digital Media Technology, School of Computing and Digital Technology, Birmingham City University, Birmingham, United Kingdom

- Leading submissions for bids and project proposals (InnovateUK KTP)
- PhD Supervision
- Teaching (MSc and BSc levels, please refer to teaching section below)
- Augmented Reality (AR) Human Computer Interaction (HCI) Research, user experience, usability, user interaction
- Dissemination of research findings (Interact, ICMI, VSGames, among others)

Aug. 2017 -
Oct. 2018

Research Fellow (FTE), DMT Lab, Birmingham City University, Birmingham, United Kingdom

- Bids and project proposals (InnovateUK KTP, Audiences of the Future, AHRC, Microsoft)
- PhD Supervision
- ICURe Entrepreneurial Lead (InnovateUK Competitive programme for commercializing research)
- HCI research, usability, user experience, user interaction
- Dissemination of research findings (ISMAR, TOCHI, VRST, ICMI, among others)

- Oct. 2015 - Jul. 2017 **Research Assistant (FTE)**, DMT Lab, Birmingham City University, Birmingham, United Kingdom
- Innovation Engine project (ERDF funded)
 - HCI research, usability, user interaction analysis
 - Dissemination of research findings
 - Development of a new mixed reality interactive system for medical visualisation and demonstration
 - Bids and project proposals (i.e. Innovate UK KTP, bid for hosting ISMAR 2017)
 - Project manager in Maker Monday BCU Event (Institute for Creative Innovation)
- Oct. 2011 - Sep. 2015 **Research Assistant (FTE)**, Deustotech-Life, University of Deusto, Bilbao, Spain
- Conduct research in serious games and accessibility
 - Supervise undergraduate final year projects
 - Identify and obtain sources of external funding for new projects
- Sep. 2014 - Dec. 2014 **Research Stay (FTE)**, Computer Games and Multimedia Research laboratory, University of Wolverhampton, Wolverhampton, United Kingdom
- Research stay conducted under a researcher exchange scheme programme
- Oct. 2008 - Sep. 2011 **Part-Time Research Assistant (PTE)**, Deustotech-Life, University of Deusto, Bilbao, Spain

TEACHING/ACADEMIC EXPERIENCE

- **PhD Completions:**
 - Dr Maadh Al-Kalbani "*Natural Freehand Grasping of Virtual Objects for Augmented Reality*" (February 2019)
 - Dr Andreea Dalia Blaga "*Grasping taxonomy for Virtual Objects in Augmented Reality*" (March 2023)
 - Dr Farkhandah Komal "*Novel interaction techniques for enhanced web accessibility*" (July 2023)
 - Dr Bharat Paudyal "*Assistive interaction for coding in software development environments*" (December 2023)
 - Dr Mattia Colombo "*Acoustic Information Retrieval for Interactive Sound Rendering in Virtual Environments*" (February 2025)
- **PhD Supervision (in progress):**
 - Ms Rebecca Spittle "*Multimodal interaction in immersive environments*" (DoS)
 - Mr Bibek Khattri "*Augmented Reality for Radiotherapy Training*"
 - Mr Oliver Collier "*Inclusive VR games for d/Deaf and hard of hearing people*"

- **Teaching - Masters Level (MSc):**
 - Advanced and Immersive Technologies (*MSc in User Experience, Birmingham City University*) (**module leader**)
 - Individual Master's Project (*MSc in User Experience, Birmingham City University*) (**module leader, MSc dissertations coordinator**)
 - Human Centered Design (*MSc in User Experience, Birmingham City University*)
 - Research Methods and Evaluation (*MSc in User Experience, Birmingham City University*)
 - Research Methods (*MSc in Broadcast Engineering, Birmingham City University*)
- **Teaching - Undergraduate Level (BSc):**
 - Digital Image Processing (*BSc in Digital Media Technology, Birmingham City University*) (**module leader**)
 - User Experience Design (*BSc in Computer Science, Birmingham City University*)
 - Digital Media Processing (*BSc in Digital Media Computing, Birmingham City University*)
 - Research and Testing Methods (*BSc in Film Production Technology*) (*BSc in Film Technology and Visual Effects*)

PUBLICATIONS, INTERNATIONAL JOURNALS

- Blaga, A.D, **Frutos-Pascual, M.**, Creed, C., & Williams, I. (2024). VR-Grasp - A Human Grasp Taxonomy for Virtual Reality. *International Journal of Human Computer Interaction*. DOI: [10.1080/10447318.2024.2351719](https://doi.org/10.1080/10447318.2024.2351719)
- Spittle, B., **Frutos-Pascual, M.**, Creed, C., Williams, I. (2022). A Review of Interaction Techniques for Immersive Environments. *IEEE Transactions on Visualization and Computer Graphics*. DOI: [10.1109/TVCG.2022.3174805](https://doi.org/10.1109/TVCG.2022.3174805)
- Al-Kalbani, M., **Frutos-Pascual, M.**, Williams, I. (2020). Evaluation of Drop Shadows for Virtual Object Grasping in Augmented Reality. *IEEE Computer Graphics and Applications*. DOI: [10.1109/MCG.2020.2991839](https://doi.org/10.1109/MCG.2020.2991839)
- **Frutos-Pascual, M.**, Garcia-Zapirain, B. (2015). Review of the Use of AI Techniques in Serious Games: Decision making and Learning. *IEEE Transactions on Computational Intelligence and AI in games*. DOI: [10.1109/TCIAIG.2015.2512592](https://doi.org/10.1109/TCIAIG.2015.2512592)
- **Frutos-Pascual, M.**, Garcia-Zapirain, B. (2015). Assessing Visual Attention Using Eye Tracking Sensors in Intelligent Cognitive Therapies Based on Serious Games. *Sensors*, **15**(4), pp. 11092-11117. DOI: [10.3390/s150511092](https://doi.org/10.3390/s150511092)
- **Frutos-Pascual, M.**, Zapirain, B. G., & Zorrilla, A. M. (2014). Adaptive Tele-Therapies Based on Serious Games for Health for People with Time-Management and Organisational Problems: Preliminary Results. *International journal of environmental research and public health*, **11**(1), pp. 749-772. DOI: [10.3390/ijerph110100749](https://doi.org/10.3390/ijerph110100749)

PUBLICATIONS, INTERNATIONAL CONFERENCES

- Paudyal, B., Creed, C., **Frutos-Pascual, M.** and Williams, I., (2022, July). Inclusive Multimodal Voice Interaction for Code Navigation. In Proceedings of the *2022 ACM International Conference on Multimodal Interaction* (pp. 509-519).
DOI: [10.1145/3536221.3556600](https://doi.org/10.1145/3536221.3556600)
- Aziz, F., Creed, C., Sarcar, S., **Frutos-Pascual, M.**, & Williams, I. (2022, June). Voice Snapping: Inclusive Speech Interaction Techniques for Creative Object Manipulation. In Proceedings of the *2022 ACM Designing Interactive Systems Conference* (pp. 1486 - 1496).
DOI: [10.1145/3532106.3533452](https://doi.org/10.1145/3532106.3533452)
- Blaga, A.D, **Frutos-Pascual, M.**, Creed, C., & Williams, I. (2021, December). Virtual Object Categorisation Methods: Towards a Richer Understanding of Object Grasping for Virtual Reality. In Proceedings of the 27th ACM Symposium on Virtual Reality Software and Technology (VRST)
DOI: [10.1145/3489849.3489875](https://doi.org/10.1145/3489849.3489875)
- Spittle, B., Xu, W., **Frutos-Pascual, M.**, Creed, C., & Williams, I. (2021, October). Socially Distanced: Have user evaluation methods for Immersive Technologies changed during the COVID-19 pandemic? In Adjunct Proceedings of the 2021 International Symposium on Mixed and Augmented Reality (ISMAR)
DOI: [10.1109/ISMAR-Adjunct54149.2021.00094](https://doi.org/10.1109/ISMAR-Adjunct54149.2021.00094)
- Blaga, A.D, **Frutos-Pascual, M.**, Creed, C., & Williams, I. (2021, October). A Grasp on Reality: Understanding Grasping Patterns for Object Interaction in Real and Virtual Environments. In Adjunct Proceedings of the 2021 International Symposium on Mixed and Augmented Reality (ISMAR)
DOI: [10.1109/ISMAR-Adjunct54149.2021.00094](https://doi.org/10.1109/ISMAR-Adjunct54149.2021.00094)
- Aziz, F., Creed, C., **Frutos-Pascual, M.**, & Williams, I. (2021, October). Inclusive Voice Interaction Techniques for Creative Object Positioning. In Proceedings of the 2021 International Conference on Multimodal Interaction (ICMI)
DOI: <https://doi.org/10.1145/3462244.3479937>
- **Frutos-Pascual, M.**, Gale, C., Harrison, J., Creed, C., & Williams, I. (2021, September). Character Input in Augmented Reality: An evaluation of keyboard position and interaction visualisation for Head-Mounted Displays. In Proceedings of *18th IFIP TC. 13 International Conference on Human-Computer Interaction (INTERACT)*. IFIP.
DOI: https://doi.org/10.1007/978-3-030-85623-6_29
- Blaga, A. D., **Frutos-Pascual, M.**, Creed, C., & Williams, I. (2021, March). Freehand Grasping: An Analysis of Grasping for Docking Tasks in Virtual Reality. In Proceedings of *IEEE VR Conference*. IEEE.
DOI: [10.1109/VR50410.2021.00102](https://doi.org/10.1109/VR50410.2021.00102)
- Paudyal, B., Creed, C., **Frutos-Pascual, M.** and Williams, I., (2020, July). Voiceeye: A Multimodal Inclusive Development Environment. In Proceedings of the *2020 ACM Designing Interactive*

Systems Conference (pp. 21-33).

DOI: <https://doi.org/10.1145/3357236.3395553>

- Blaga, A. D., **Frutos-Pascual, M.**, Creed, C., & Williams, I. (2020, April). Too Hot to Handle: An Evaluation of the Effect of Thermal Visual Representation on User Grasping Interaction in Virtual Reality. In *Proceedings of ACM CHI Conference on Human Factors in Computing Systems (CHI)*. ACM.
DOI: <https://doi.org/10.1145/3313831.3376554>
- Creed, C., **Frutos-Pascual, M.**, & Williams, I. (2020, April). Multimodal Gaze Interaction for Creative Design. In *Proceedings of ACM CHI Conference on Human Factors in Computing Systems (CHI)*. ACM.
DOI: <https://doi.org/10.1145/3313831.3376196>
- **Frutos-Pascual, M.**, Harrison, J., Creed, C., & Williams, I. (2019, October). Evaluation of Ultrasound Haptics as a Supplementary Feedback Cue for Grasping in Virtual Environments. In *Proceedings of 21st ACM International Conference on Multimodal Interaction (ICMI)*. ACM.
DOI: [10.1145/3340555.3353720](https://doi.org/10.1145/3340555.3353720)
- **Frutos-Pascual, M.**, Creed, C., & Williams, I. (2019, September). Head Mounted Display Interaction Evaluation: Manipulating Virtual Objects in Augmented Reality. In *Proceedings of 17th IFIP TC. 13 International Conference on Human-Computer Interaction (INTERACT)*. IFIP. *(Winner of the Reviewers' choice award)*
DOI: [10.1007/978-3-030-29390-1_16](https://doi.org/10.1007/978-3-030-29390-1_16)
- Al-Kalbani, M., **Frutos-Pascual, M.**, & Williams, I. (2019, September). Virtual Object Grasping in Augmented Reality: Drop Shadows for Improved Interaction. In *Proceedings of 11th International Conference on Virtual Worlds and Games for Serious Applications (VSGames)*.
DOI: [10.1109/VS-Games.2019.8864596](https://doi.org/10.1109/VS-Games.2019.8864596)
- Al-Kalbani, M., **Frutos-Pascual, M.**, & Williams, I. (2017, November). Freehand grasping in mixed reality: analysing variation during transition phase of interaction. In *Proceedings of the 19th ACM International Conference on Multimodal Interaction (ICMI)* (pp. 110-114). ACM.
DOI: [10.1145/3136755.3136776](https://doi.org/10.1145/3136755.3136776)
- Blaga, A. D., **Frutos-Pascual, M.**, Al-Kalbani, M., & Williams, I. (2017, October). [POSTER] Usability Analysis of an Off-the-Shelf Hand Posture Estimation Sensor for Freehand Physical Interaction in Egocentric Mixed Reality. In *Mixed and Augmented Reality (ISMAR-Adjunct), 2017 IEEE International Symposium on* (pp. 31-34). IEEE.
DOI: [10.1109/ISMAR-Adjunct.2017.25](https://doi.org/10.1109/ISMAR-Adjunct.2017.25)
- Al-Kalbani, M., **Frutos-Pascual, M.**, & Williams, I. (2016, November). Improving Freehand Placement for Grasping Virtual Objects via Dual View Visual Feedback in Mixed Reality. In *22nd ACM Symposium on Virtual Reality Software and Technology (VRST)*, 2016. ACM.
DOI: [10.1145/2993369.2993401](https://doi.org/10.1145/2993369.2993401)
- Al-Kalbani, M., Williams, I., & **Frutos-Pascual, M.** (2016, September). Analysis of Medium Wrap Freehand Virtual Object Grasping in Exocentric Mixed Reality. In *15th IEEE International*

Symposium on Mixed and Augmented Reality (ISMAR), 2016 (in press). IEEE.

DOI: [10.1109/ISMAR.2016.14](https://doi.org/10.1109/ISMAR.2016.14)

- Dolhasz, A., Williams, I., & **Frutos-Pascual, M.** (2016, September). Measuring Observer Response to Object-Scene Disparity in Composites. In *15th IEEE International Symposium on Mixed and Augmented Reality (ISMAR)*, 2016 (in press). IEEE.

DOI: [10.1109/ISMAR-Adjunct.2016.0028](https://doi.org/10.1109/ISMAR-Adjunct.2016.0028)

OTHER MERITS (Grants, Awards, Committees, Scholarships)

- **Fellow of the Higher Education Academy (FHEA)** - May 2021
- **AURORA Advance HE's leadership development initiative for women** - 2021 Cohort
- **Midlands: Innovation to Commercialisation of University Research (ICURe) Programme**
Innovate UK - Competitive UK scheme for research commercialisation. Role: Entrepreneurial Lead (June - September 2018)
- **UK-China Newton Fund Researcher Links Workshop, Xi'an University of Technology** - Invited participant. British Council and National Natural Science Foundation of China (NSFC) (June 2018)
- **Ignacio Ellacuría Best PhD Dissertation Award 2016/2017** - University of Deusto
- **Innovate UK - Knowledge Transfer Partnership Immersive Imagination (2017)**
In partnership with Imagination - Role BCU partner (Academic Lead) - Successful
- **Innovate UK - Knowledge Transfer Partnership GlaxoSmithKline (GSK) (2018)**
In partnership with GSK- Role BCU partner (Academic Lead) - Successful
- **Innovate UK - Knowledge Transfer Partnership Murray Uniforms (2019)**
In partnership with Murray Uniforms- Role BCU partner (Academic Lead) - Successful

CONFERENCE COMMITTEES

- **IEEE VR 2025 - International Programme Committee Member** - 32nd IEEE Conference on Virtual Reality and 3D User Interfaces (A Conference)
- **IEEE ISMAR 2024 - International Programme Committee Member** - 23rd IEEE International Symposium on Mixed and Augmented Reality (A* Conference)
- **IEEE VR 2024 - International Programme Committee Member** - 31st IEEE Conference on Virtual Reality and 3D User Interfaces (A Conference)
- **IEEE ISMAR 2023 - International Programme Committee Member** - 22nd IEEE International Symposium on Mixed and Augmented Reality (A* Conference)
- **IEEE VRST 2023 - International Programme Committee Member** - 22nd IEEE International Symposium on Mixed and Augmented Reality (A* Conference)
- **IEEE ISMAR 2022 - International Programme Committee Member** - 21st IEEE International Symposium on Mixed and Augmented Reality (A* Conference)
- **IEEE ISMAR 2021 - Publication Chair** - 20th IEEE International Symposium on Mixed and Augmented Reality (A* Conference)
- **Action Modelling for Interaction and Analysis in Smart Sports and Physical Education Workshop (2020)**, 22nd ACM International Conference on Multimodal Interaction (ICMI). ACM - Organisation committee member

TECHNICAL SKILLS

Programming	Python, Java (also for Android), C#, Matlab
Data analysis	SPSS, SciPy, PSPP
Databases	SQL (Oracle, MySQL), NoSQL (MongoDB)
Design and others	Unity, Blender 3D, GIMP, Photoshop
Hardware	Electronic circuits build and design, Sensors Integration
Office automation	LaTeX (advance), MS Office (expert)
Operative Systems	Ubuntu, Windows, MAC OS
Version control	SVN, GIT

LANGUAGES

Spanish	Native
English	Fluent (spoken and written) (Accredited C1)
German	Basic (Accredited A2)

CERTIFICATES

SEDA Certificate	Supervising Undergraduate Research (<i>June 2017</i>)
SEDA Certificate	Supervising Master's Degree Research (<i>June 2017</i>)
SEDA Certificate	Community of Practice Around Research Supervision (<i>November 2018</i>)

