

CV Date	20/09/2023
---------	------------

Part A. PERSONAL INFORMATION

First Name	María Elena		
Family Name	Hernando Pérez		
Sex	Female	Date of Birth	
ID number Social Security, Passport			
URL Web	http://www.gbt.tfo.upm.es		
Email Address	mariaelena.hernando@upm.es		
Open Researcher and Contributor ID (ORCID)	0000-0001-6182-313X		

A.1. Current position

Job Title	Catedrática de Universidad		
Starting date	2018		
Institution	Universidad Politécnica de Madrid		
Department / Centre			
Country	Spain	Phone Number	91 - 0671900 ext 72453
Keywords	330700 - Electronic technology		

A.3. Education

Degree/Master/PhD	University / Country	Year
Doctor Ingeniero de Telecomunicación	Universidad Politécnica de Madrid - ETS Ingenieros de Telecomunicación / Spain	1997
Ingeniera de Telecomunicación	Universidad Politécnica de Madrid, ETSI Telecomunicación	1990

Part B. CV SUMMARY

María Elena Hernando Pérez is Full Professor at the Universidad Politécnica de Madrid (UPM). She has developed her teaching and research activity in the field of Biomedical Engineering, at the ETSI of Telecommunications of the UPM. She belongs to the Bioengineering and Telemedicine Group (GBT) and is a founding member of the UPM Center for Biomedical Technology (CTB).

Main scientific-technical achievements: In 1990, she started her research in the definition of telemedicine solutions for chronic patients monitoring and the application of Artificial Intelligence either to predict risk events for the patient or to provide decision support tools to health care professionals. One of the technical challenges has been the integration of sensors in telemedicine systems to minimize patient intervention. One of the last achievements was the use of our telemedicine platform for monitoring pregnant women with Gestational Diabetes during the COVID lockdown. Her team has proposed an artificial pancreas algorithm, closing the loop between the continuous glucose sensor and the insulin pump and supported by a telemedical platforms. The AP algorithm was successfully evaluated in a clinical study at Sabadell Hospital and further AP proposals are in progress in an international collaboration with the Guadalajara University, Mexico. She collaborates with several prestigious international working groups of European universities and hospitals funded by European Research Programs.

Contribution to society: Her research has produced scientific results in the form of 41 articles in international journals indexed in JCR, 10 articles in indexed journals Scopus / Pubmed, +120 international conferences of the highest prestige, +90 national conferences, the direction of eight doctoral theses, two patents and two software registers. She is member of IEEE (2002), member of the Spanish Society of Biomedical Engineering (SEIB, 1994) and the Spanish

Society of Diabetes (2011). She is a Senior Member of the IEEE since 2012, a member of the National Committee of the group CEN-TC251, AEN / CTN 139 "Information Technologies and Communications for Health", a member of the Scientific Advisory Committee of the Spanish Society of Health Informatics (SEIS) since 2020 and member of the ELLIS Society (European Laboratory for Learning and Intelligent Systems) since July 2021. She has been the main researcher of 26 R&D projects with different sources of funding (15 national programs / 4 European / 8 company contracts) and she has participated as collaborator in 38 R&D additional projects.

Input to the training of young investigators: She is participating in doctoral level teaching for the past 24 years and she supervised 9 PhD doctoral thesis. She is currently a Group Principal Investigator at the Center for Networked Biomedical Research in Bioengineering, Biomaterials and Nanomedicine (CIBER-BBN) of the Carlos III Health Institute. She is member of the editorial board of the Methods of Information in Medicine Journal, reviewer in international journals (IEEE Transactions on Biomédica Engineering, Computer Methods and Programs in Biomedicine,...) and participates in National Evaluation Committees (ANEP, ANECA-CNEAI) for researchers evaluation.

Part C. RELEVANT ACCOMPLISHMENTS

C.1. Most important publications in national or international peer-reviewed journals, books and conferences

AC: corresponding author. (n° x / n° y): position / total authors. If applicable, indicate the number of citations

- 1 Scientific paper.** Carlos E. Castañeda; Onofre Orozco-López; Alfredo Abad-Gurumeta; M. Elena Hernando; Agustín Rodríguez-Herrero. 2023. Personalized asymmetric multiple PID to automatize the procedure of intravenous general anesthesia. Journal of Process Control. 128. <https://doi.org/10.1016/j.procont.2023.103019>
- 2 Scientific paper.** Orozco-López, Onofre; Castañeda, Carlos E.; García-Sáez, Gema; Elena Hernando, M.; Rodríguez-Herrero, Agustín. 2022. Personalized hybrid artificial pancreas using unidirectional sliding-modes control algorithm. Biocybernetics and Biomedical Engineering. 42-4, pp.1218-1235. ISSN 0208-5216.
- 3 Scientific paper.** Kamusheva; Tachkov; Dimitrova; Mitkova; García-Sáez; Hernando; Goettsch; Petrova. (6/8). 2021. A Systematic Review of Collective Evidences Investigating the Effect of Diabetes Monitoring Systems and Their Application. Front. Endocrinol.12, pp.636959. <https://doi.org/10.3389/fendo.2021.636959>
- 4 Scientific paper.** M. Simões; D. Borra; E. Santamaría-Vázquez; et al; M. Castelo-Branco. 2020. BCIAUT-P300: a Multi-Session and Multi-Subject Benchmark Dataset on Autism for P300-based Brain-Computer-Interfaces. doi: 10.3389/fnins.2020.568104. <https://doi.org/10.3389/fnins.2020.568104>
- 5 Scientific paper.** L Albert; I Capel; G. García-Sáez; P. Martín-Redondo; M.E. Hernando; M. Rigla. 2020. Managing gestational diabetes mellitus using a smartphone application with artificial intelligence (SineDie) during the COVID-19 pandemic: Much more than just telemedicine. Diabetes Research and Clinical Practice. Official journal of the International Diabetes Federation. <https://doi.org/doi.org/10.1016/j.diabres.2020.108396>
- 6 Scientific paper.** O. Orozco-López; A. Rodríguez-Herrero; C.E. Castañeda; G. García-Sáez; M.E. Hernando. 2020. Method to generate a large cohort in-silico for type 1 diabetes. Computer methods and programs in biomedicine. Elsevier. 193, pp.105523. <https://doi.org/10.1016/j.cmpb.2020.105523>
- 7 Scientific paper.** J. Carrillo-Moreno; C. Pérez-Gandía; R. Sendra-Arranz; G. García-Sáez; M.E. Hernando; A. Gutiérrez. 2020. Long short-term memory neural network for glucose prediction. Neural Computing and Applications. Springer. <https://doi.org/10.1007/s00521-020-05248-0>

- 8 **Scientific paper.** M.E. Hernando (AC); G. García-Sáez; E.J. Gómez; C. Pérez-Gandía; A. Rodríguez-Herrero. (1/5). 2020. Automated Insulin Delivery: The Artificial Pancreas Technical Challenges. *Am J Ther.* 27-1, pp.e62-e70. <https://doi.org/10.1097/MJT.0000000000001086>
- 9 **Scientific paper.** Orozco-Lopez O.; Castaneda C.; Rodriguez-Herrero A.; Garcia-Saez G.; Hernando E.2018. Linear time-varying Luenberger observer applied to diabetes. *IEEE Access.* <https://doi.org/10.1109/ACCESS.2018.2825989>
- 10 **Scientific paper.** Rigla, Mercedes; Garcia-Saez, Gema; Pons, Belen; Hernando, Maria Elena. 2018. Artificial Intelligence Methodologies and Their Application to Diabetes. *Journal of diabetes science and technology.* 12-2, pp.303-310. ISSN 1932-2968. WOS (1) <https://doi.org/10.1177/1932296817710475>
- 11 **Scientific paper.** Perez-Gandia, Carmen; Garcia-Saez, Gema; Subias, David; Rodriguez-Herrero, Agustin; Gomez, Enrique J; Rigla, Mercedes; Hernando, M Elena. (7/7). 2018. Decision Support in Diabetes Care: The Challenge of Supporting Patients in Their Daily Living Using a Mobile Glucose Predictor. *Journal of diabetes science and technology.* 12-2, pp.243-250. ISSN 1932-2968. WOS (0) <https://doi.org/10.1177/1932296818761457>
- 12 **Scientific paper.** Orozco, Onofre; Eduardo Castaneda, Carlos; Rodriguez-Herrero, Agustin; Garcia-Saez, Gema; Hernando, M. Elena. (5/5). 2018. Luenberger observer with nonlinear structure applied to diabetes type 1. *INTERNATIONAL JOURNAL OF COMBINATORIAL OPTIMIZATION PROBLEMS AND INFORMATICS. INT JOURNAL COMBINATORIAL OPTIMIZATION PROBLEMS & INFORMATICS.* 9-1, pp.68-80. ISSN 2007-1558. WOS (0)
- 13 **Scientific paper.** Vasquez-Cevallos, Leonel A.; Bobokova, Jana; Gonzalez-Granda, Patricia V.; Iniesta, Jose M.; Gomez, Enrique J.; Elena Hernando, M.(6/6). 2018. Design and Technical Validation of a Telemedicine Service for Rural Healthcare in Ecuador. *Telemedicine and E-Health.* 24-7. <https://doi.org/10.1089/tmj.2017.0130>
- 14 **Scientific paper.** Caballero-Ruiz, Estefania; Garcia-Saez, Gema; Rigla, Mercedes; Villaplana, Maria; Pons, Belen; Elena Hernando, M.(6/6). 2017. A web-based clinical decision support system for gestational diabetes: Automatic diet prescription and detection of insulin needs. *International Journal of Medical Informatics.* 102, pp.35-49. ISSN 1386-5056. <https://doi.org/10.1016/j.ijmedinf.2017.02.014>
- 15 **Scientific paper.** Peleg, Mor; Shahar, Yuval; Quaglini, Silvana; et al; van Schooten, Boris. 2017. Assessment of a personalized and distributed patient guidance system. *International Journal of Medical Informatics.* 101, pp.108-130. <https://doi.org/10.1016/j.ijmedinf.2017.02.010>
- 16 **Scientific paper.** Peleg, Mor; Shahar, Yuval; Quaglini, Silvana; et al; Soffer, Pnina. 2017. MobiGuide: a personalized and patient-centric decision-support system and its evaluation in the atrial fibrillation and gestational diabetes domains. *User Modeling and User-Adapted Interaction.* 27-2, pp.159-213. <https://doi.org/10.1007/s11257-017-9190-5>
- 17 **Scientific paper.** Garcia-Garcia, Fernando; Hovorka, Roman; Wilinska, Malgorzata E.; Elleri, Daniela; Elena Hernando, M.(5/5). 2017. Modelling the effect of insulin on the disposal of meal-attributable glucose in type 1 diabetes. *Medical & Biological Engineering & Computing.* 55-2, pp.271-282. ISSN 0140-0118. <https://doi.org/10.1007/s11517-016-1509-6>
- 18 **Scientific paper.** Garcia-Garcia, Fernando; Benito, Pedro J.; Hernando, Maria E.(3/3). 2016. Automatic Identification of Physical Activity Intensity and Modality from the Fusion of Accelerometry and Heart Rate Data. *Methods of Information in Medicine.* 55-6, pp.533-544. <https://doi.org/10.3414/ME15-01-0130>
- 19 **Scientific paper.** Estefanía Caballero-Ruiz; Gema García-Sáez; Mercedes Rigla; María Villaplana; Belén Pons; M. Elena Hernando. (6/6). 2016. Automatic classification of glycaemia measurements to enhance data interpretation in an expert system for gestational diabetes. *Expert Systems with Applications.* Elsevier {BV}. 63, pp.386-396. <https://doi.org/10.1016/j.eswa.2016.07.019>

- 20 Scientific paper.** Moreno, P.A.; Elena Hernando, M.; Gomez, E.J.(2/3). 2015. Design and technical evaluation of an enhanced location-awareness service enabler for spatial disorientation management of elderly with mild cognitive impairment. IEEE Journal of Biomedical and Health Informatics. 19-1, pp.37-43. ISSN 2168-2194. <https://doi.org/10.1109/JBHI.2014.2327638>
- 21 Scientific paper.** Garcia-Garcia, Fernando; Kumareswaran, Kavita; Hovorka, Roman; Hernando, M. Elena. (4/4). 2015. Quantifying the Acute Changes in Glucose with Exercise in Type 1 Diabetes: A Systematic Review and Meta-Analysis. Sports Medicine. 45-4, pp.587-599. <https://doi.org/10.1007/s40279-015-0302-2>

C.3. Research projects and contracts

- 1 Project.** ELADAIS: Extracción, Almacenamiento y Análisis de Datos con Alto Impacto Social. Ministerio de Asuntos Económicos y Transformación Digital [UNICO Cloud]. Menasalvas Ruiz. (Universidad Politécnica de Madrid). 2023-2025.
- 2 Project.** PROPHECY: PRedicción Optimizada Preprandial de glucosa con estimación objetiva de Ejercicio y Carbohidratos para el cálculo de insulina en sistemas Do-It-Yourself.. Instituto de Salud Carlos III. M. Elena Hernando Pérez. (Universidad Politécnica de Madrid). 01/01/2022-31/12/2024. 75.020 €.
- 3 Project.** HTx: Next Generation Health Technology Assessment to support patient-centred, societally oriented, real-time decision-making on access to and reimbursement for health technologies throughout Europe. (H2020-EU.3.1.6. GA 825162). Unión Europea. Gema García Sáez. (Universidad Politécnica de Madrid). 01/01/2019-31/12/2023. 382.000 €.
- 4 Project.** ALIBIRD2020-CM: Fórmulas terapéuticas de nutrición de precisión para el cáncer. Programas de I+D en Tecnología (S2018/BAA-4343). Comunidad de Madrid; Cofinanciado con Fondos Estructurales de la Unión Europea. Guillermo Reglero. (Universidad Politécnica de Madrid). 01/01/2019-31/12/2022. 1.052.421 €.
- 5 Project.** EmERGE: "Evaluating mHealth technology in HIV to improve Empowerment and healthcare utilisation: Research and innovation to Generate Evidence for personalised care". Comisión Europea. H2020.. M. Elena Hernando Pérez. (Universidad Politécnica de Madrid). 01/05/2015-31/05/2020. 230.300 €.
- 6 Project.** FitCloop: Incorporación de la medida continua de ejercicio al control en lazo cerrado en la diabetes tipo 1. Fondo de Investigaciones Sanitarias PI14/00109. M^a Elena Hernando Pérez. (Universidad Politécnica de Madrid). 01/01/2015-30/06/2018. 11.410 €.
- 7 Project.** MobiGuide: Guiding Patients Anytime Everywhere. Unión Europea - FP7-ICT-2011- 287811. María Elena Hernando Pérez. (Universidad Politécnica de Madrid). 01/11/2011-30/10/2015. 473.672 €.
- 8 Project.** SineDie: Sistemas INteligentes y de Educación para el control de la Diabetes diagnosticada en el Embarazo -. Fondo de Investigaciones Sanitarias PI10/01125. M^a Elena Hernando Pérez. (Universidad Politécnica de Madrid). 01/01/2011-31/12/2013. 50.227,1 €.
- 9 Contract.** Cognitive computing aplicado a psiquiatría - FASE 3 IBM (International Business Machines S.A). M. Elena Hernando Pérez. 2018-01/01/2020. 6.000 €.
- 10 Contract.** Estado del arte en el desarrollo de aplicaciones móviles para atención socio domiciliaria a mayores ACCIONA SMART CITY SERVICES. Enrique Javier Gomez Aguilera. 10/10/2017-09/11/2017. 3.000 €.
- 11 Contract.** SINEDIE-Móvil- Sistemas inteligentes y de educación para el control de la diabetes diagnosticada en el embarazo. Fundació Parc Taulí. Gema García Sáez. 01/10/2017-01/10/2018. 12.000 €.

C.4. Activities of technology / knowledge transfer and results exploitation

- 1 Registro de software.** M005381/2014. AppSiMe: Asistente Personal para la prevención del Síndrome Metabólico 16/2014/8630 22/07/2014. Universidad Politécnica de Madrid.
- 2 Registro de software.** M002812/2007. DIABSIM V1.0 29/04/2009. Universidad Politécnica de Madrid.