UNIVERSITY: Universidad de Navarra

WIT AREA:

☐**Automotive, Mechatronics and Advance Manufacture**

☐**Health**

☐**Energy**

☒**IA**

WIT PROGRAMME´S RESEARCH LINE NAME: Personalized medicine determining optimal patient-driven treatments

DOCTORAL PROGRAMME: https://en.unav.edu/web/doctoral-program-in-natural-and-applied-sciences

COMPLETE DESCRIPTION OF THE LINE (max. 1000 characters)

General treatments for all patients may be beneficial for a percentage, but not necessarily for most or all of them. Optimizing the treatment for each patient is crucial. It is necessary to model the evolution of the disease according to the characteristics of the patient to establish an efficient minimally invasive therapy for each one. In particular,
1. Searching for models to make a decision.
2. Looking for personalized experimental designs.
3. Performing the experiments and fitting the model.
4. Using the model to elaborate protocols for physicians.
The objectives of the thesis will be developing:
a. A closed planning of a treatment for each patient. Variables such as age, sex, tumor size or BMI will be used for that.

b) An intelligent learning planning of the treatment. Some not-easy-to-do analyses are performed to the patient at established times to check how the treatment is being effective. These times can be optimized for each patient leading to corrections in the treatment.

RESEARCH GROUP NAME: Design statistics and data analysis group (StatData) in the Institute of Data Science and AI (DATAI).

COORDINATOR:

- Last and first name; link to the "Portal of scientific production": López-Fidalgo, Jesús; https://www.unav.edu/web/investigacion/nuestros-investigadores/detalle-investigadores-cv?investigadorId=164369&investigador=L%C3%B3pez%20Fidalgo,%20Jes%C3%BAs%20Fernando
- Department: Institute of Data Science and Artificial Intelligence.
- Email: fidalgo@unav.es
- Telephone number: +34 948 425600 (ext. 805634).

MEMBERS OF THE LINE RESEARCH: This is the part of the team in the University of Navarra

Edgar Benítez

Maite Aznárez

Carlos de la Calle

Horacio Boada

Juan Carlos Gamero

Álvaro Cía

Pablo Urruchi

ANOTHER RESEARCH LINES OF THE GROUP: list of them

Digital twins for energy saving in buildings.

Algorithm fairness.

Green algorithms.

- Entities involved in research lines and contact person:

- Academic entities: (with recent joint published papers)

  Universitiy of Salamanca: Juan Manuel Rodríguez-Díaz.
  Universitiy of Castilla-La Mancha: Mariano Amo Salas.
  Public Universitiy of Navarra: José Antonio Moler.
  Universitá degli Studi di Milano, Italy: Chiara Tommasi.
  Universitá di Firenze, Italy: Rossella Berni.
  University of California in Los Angeles (UCLA), USA: Weng Kee Wong.
  Universitá degli Studi del Piemonte Orientale, Italy: Caterina May.
  University of Alberta, Canada: Douglas Wiens.

- Industrial entities:

  BBVA (Marco Bonilla).
  Asociación de la Industria Navarra (AIN, Pilar Herrera).

- Joint supervision of doctoral thesis with international universities or non-academic institutions:

"Active learning" (Alvaro Cía) with Chiara Tommasi.
Industrial PhDs (10) with BBVA in the Institute of Data Science and AI (DATAI).

- Brief group overview (max. 1000 characters)

Prof. López-Fidalgo created a group at the University of Salamanca, extended to Castilla-La Mancha in 2005 and the University of Navarra in 2016. The group has a number of current international active collaborations. Its main topic is Optimal Experimental Design (OED) with more than 25 researchers. This group is one of the eight nodes of the Spanish Network of Biostatistics. It is also a research group of the Spanish Statistical Society. The group has been supported by different grants from the Spanish Research Agency since 2004 as well as some international grants (apart from some regional or local, apart from contracts with companies). The group has published in the best journals of Statistics such as JASA; JRSSB; Technometrics, the Annals of Applied Statistics or JRSSC. Current topics of research of OED in the group are spatial statistics, survival analysis, pharmacokinetic models, active learning, marginally restricted designs or dose-response models.

- Link of the group to the "Portal of scientific production"

https://www.unav.edu/web/grupo-investigadores/diseno-estadistico-y-analisis-de-datos
https://www.uclm.es/ciudad-real/etsii/etsii-cr/investigacion/oed
https://investigacion.usal.es/es/GIR/162#content

- Pictures, links… to academic or industrial partners (if any)

NA

ACADEMIC REQUIREMENTS:

Deep mathematical and statistical background.

Expertise with some modern coding languages such as Python, R, Mathematica…

ADDITIONAL REQUIREMENTS:

Fluent English reading and speaking.