Dimitrios Doudesis, PhD

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WORK EXPERIENCE

Postdoctoral Research Fellow, The University of Edinburgh, March 2022 – Present
& Lecturer, Health Data Science, The University of Edinburgh, September 2022 – Present

- Develop algorithms using statistical machine learning to predict the diagnoses of heart failure (CoDE-HF) and heart attack (CoDE-ACS) in the emergency department.
- Develop the CoDE-HF and CoDE-ACS algorithms in products that integrate into the NHS clinical workflow.
- Co-leading the modelling workstream, part of the Artificial Intelligence in Acute Cardiac Care project.
- Develop, deploy and maintenance of the online decision-support tools using R Shiny (https://decision-support.shinyapps.io/code-hf/ & https://decision-support.shinyapps.io/code-acs/)
- Lead the prospective validation of the two machine learning algorithms using EHR and respective biomarkers.
- Retrain the CoDE-HF and CoDE-ACS algorithms to be used with different biomarkers/assays.
- Lead and support the prespecified secondary analyses of the High-STEACS and HiSTORIC stepped-wedge cluster randomised controlled trials (NCT01852123 & NCT03005158).
- Develop statistical analysis plans, conducting sample size calculations and power analyses.
- Establish national and international collaborations, which will lead to top-tier journal publications.
- Statistical and programming supervisor of two PhD students.
- Line manager of two teaching assistants for the Health Data Science course.

Research Fellow, The University of Edinburgh, October 2021 – February 2022
Wrote a grant for and obtained funding from NIHR and NHSX for the development and validation of a machine learning algorithm to improve the diagnosis of heart attack. Was also responsible for the project management and the overall delivery of the grant (AI_AWARD02322).

Research Assistant, The University of Edinburgh, April 2020 – September 2020
Worked as a Research Assistant for Dr Areti Manataki on the project "*Student perspectives on Learning and Teaching Data Science in the MBChB programme"*. Publication: Doudesis D & Manataki A. 2022;159:104668.

Teaching Assistant, The University of Edinburgh, September 2019 – September 2021
Courses: *Data Science in Medicine; Machine Learning in Python; Introduction to Statistics; Statistics (Year 2); Statistical Modelling; Statistical Computing; Biomedical Data Science; Health Data Science*.

Data Analyst, PREDICTA S.A (former SPSS BI GREECE S.A), March 2017 – September 2017.
Worked as a Consultant for a systemic bank in Greece. Resigned from this position to pursue an MSc in the UK.

QUALIFICATIONS

- **PhD, Data Science,** The University of Edinburgh, 2018-2022
  Thesis: *Improving diagnosis in acute cardiac care using statistical machine learning*.
- **MSc, Medical Statistics**, The University of Southampton, 2017-2018
  Dissertation: *Feature selection algorithms for the development of parsimonious statistical machine learning models.* (Distinction)
- **BSc, Statistics,** The Athens University of Economics and Business, 2013-2017
  Grade 7.8/10. (Class rank: 2 of 118).

PROFESSIONAL AFFILIATIONS

- Certified Carpentries Instructor, 2023 – Present
- Fellow of Royal Statistical Society (FRSS), 2021 – Present
- Associate Fellow of Higher Education (AFHE), 2021 – Present
- Member of Association of Data Scientists (MADaSci), 2021 – Present

PATENTS

- The University of Edinburgh (Inventors: Doudesis, Lee, Mills). Calculating the Probability of Acute Heart Failure using Natriuretic Peptide Concentration, PCT application number PCT/GB2021/051470, filed June 12, 2020. Patent issued.
- The University of Edinburgh (Inventors: Doudesis, Lee, Mills). Algorithm for Myocardial Infarction, application number P240220.GB.01, filed August 26, 2022. Patent pending.

ACADEMIC HONOURS AND AWARDS

- First prize (£500), Scottish Heart and Arterial disease Risk Prevention [SHARP] Conference, 2022
- Innovation Award (£300) - Sponsored by Edinburgh Innovations & iTPA Translational Community, BHF/Centre for Cardiovascular Science Conference, 2022
- Young Investigator Award - Clinical Cardiology (1,000€), Runner-up, European Society of Cardiology [ESC] Conference, 2020

FUNDING

GRANTS

- British Heart Foundation Translational Award (TA/F/22/210039). Artificial intelligence to guide the diagnosis of acute heart failure using the CoDE-HF algorithm. £265,622 (Co-applicant)
- Accelerated Access Collaborative in partnership with NHSX and the National Institute for Health Research Artificial Intelligence in Health and Care Award (AI_AWARD02322). Machine learning to improve the diagnosis of acute myocardial infarction. £134,589 (Co-applicant)
- British Heart Foundation Centre for Research Excellence. AI guided diagnosis of acute heart failure using the CoDE-HF algorithm. £24,741 (Co-applicant)
- Medical Research Council Confidence in Concept award (MRC/CIC8/79). AI guided diagnosis of acute heart failure using the CoDE-HF algorithm. £143,800 (Co-applicant)
- Medical Research Council Confidence in Concept Translational Bursary. £1,613 (PI)

SCHOLARSHIPS

- Medical Research Council Scholarship for PhD in Data Science, The University of Edinburgh (3.5 years - fees, stipend, and research costs), £85,960
- National Institute for Health Research Scholarship for MSc in Medical Statistics, The University of Southampton (1 year - fees and stipend), £23,553

PROGRAMMING SKILLS

• R • R Shiny (App development) • Python • SQL • SPSS Modeler • SPSS Statistics • GitHub

PUBLICATIONS

1. **Doudesis D***, Lee KK*, Anwar M*, Astengo F, Chenevier-Gobeaux C, Claessens Y-E, et al. Development and validation of a decision support tool for the diagnosis of acute heart failure: systematic review, meta-analysis, and modelling study. ***BMJ.*** 2022;377:e068424.

2. **Doudesis D***, Lee KK*, Yang J, Wereski R, Shah AS, Tsanas A, et al. Validation of the myocardial-ischaemic-injury-index machine learning algorithm to guide the diagnosis of myocardial infarction in a heterogenous population: a prespecified exploratory analysis. ***The Lancet Digital Health.*** 2022;4(5):e300-e8.

3. **Doudesis D**, Manataki A. Data science in undergraduate medicine: Course overview and student perspectives. ***International Journal of Medical Informatics.*** 2022;159:104668.

4. **Doudesis D***, Lee KK*, Boeddinghaus J*, Bularga A, Ferry AV, Tuck C, et al. Machine learning to optimise cardiac troponin for the diagnosis of myocardial infarction. ***Nature Medicine.*** (2023) [Accepted: in press]

5. Lowry MTH, **Doudesis D**, Wereski R, Kimenai DM, Tuck C, Ferry AV, et al. Influence of age on the diagnosis of myocardial infarction. ***Circulation.*** 2022;146(15):1135-48.

6. Lee KK, **Doudesis D**, Ross DA, Bularga A, MacKintosh CL, Koch O, et al. Diagnostic performance of the combined nasal and throat swab in patients admitted to hospital with suspected COVID-19. ***BMC infectious diseases.*** 2021;21(1):1-11.

7. Bularga A, Meah MN, **Doudesis D**, Shah AS, Mills NL, Newby DE, et al. Duration of dual antiplatelet therapy and stability of coronary heart disease: a 60 000-patient meta-analysis of randomised controlled trials. ***Open heart.*** 2021;8(2):e001707.

8. Wereski R, Kimenai DM, Taggart C, **Doudesis D**, Lee KK, Lowry MT, et al. Cardiac troponin thresholds and kinetics to differentiate myocardial injury and myocardial infarction. ***Circulation.*** 2021;144(7):528-38.

9. Lee KK, Bularga A, O'Brien R, Ferry AV, **Doudesis D**, Fujisawa T, et al. Troponin-guided coronary computed tomographic angiography after exclusion of myocardial infarction. ***Journal of the American College of Cardiology.*** 2021;78(14):1407-17.

10. Tibble H, Chan A, Mitchell EA, Horne E, **Doudesis D**, Horne R, et al. A data-driven typology of asthma medication adherence using cluster analysis. ***Scientific reports.*** 2020;10(1):1-8.

11. Lee KK, Bing R, Kiang J, Bashir S, Spath N, **Doudesis D**, et al. Adverse health effects associated with household air pollution: a systematic review, meta-analysis, and burden estimation study. ***The Lancet Global Health.*** 2020;8(11):e1427-e34.

12. Valavani E, **Doudesis D**, Kourtesis I, Chin RF, Macintyre DJ, Fletcher-Watson S, et al. Data-driven insights towards risk assessment of postpartum depression. ***BIOSIGNALS;*** 2020 (pp. 382-389).

* Contributed equally