THE LONDON SCHOOL OF ECONOMICS AND POLITICAL SCIENCE

Department of Statistics
Virtual Graduate Open Day

22 NOVEMBER 2023, 1:00-2:00PM

Professor Pauline Barrieu

Head of Department of Statistics

Professor Wicher Bergsma

Deputy Head of Department (Teaching)

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Plan for today

- Welcome from Professor Wicher Bergsma
- Presentations from Programme Directors of each of our MSc programmes
- Q&A Session

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Why do an MSc?

- Develop advanced quant skills: probability, modern statistical methods, statistical computing, data analysis
- Chance to specialise (theory and/or applied)
- Better prepared for quant career. Learn how to:
  - *Choose appropriate methods for given problem and data*
  - *Implement in software (or program yourself)*
  - *Interpret and communicate results*

LSE THE LONDON SCHOOL OF ECONOMICS AND POLITICAL SCIENCE

The Department of Statistics

- Home to internationally respected experts in statistics and data science
- Thriving research environment and varied seminar series
- Many career, alumni and social events
- We are a relatively small, friendly department

THE LONDON SCHOOL OF ECONOMICS AND POLITICAL SCIENCE

Our MSc Programmes

- **MSc Statistics*** - Dr. Kostas Kalogeropoulos
- **MSc Statistics (Social Statistics)*** - Professor Jouni Kuha
- **MSc Statistics (Financial Statistics)*** - Dr. Tengyao Wang
- **MSc Quantitative Methods for Risk Management** – Dr. Andreas Sojmark
- **MSc Data Science** - Professor Zoltan Szabo
- **MSc Health Data Science** - Dr. Yunxiao Chen, Dr. Ilias Kyriopoulous and Dr. Miqdad Asaria (Joint Programme with the Department of Health Policy)
  - *9- and 12-month ("Research") versions

MSc Statistics

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Degree Structure

- Compulsory
  - ST425 Statistical Inference: Principles, Methods and Computation (F)
  - **Research branch only: ST499 Dissertation (F)**
- Options
  - 3 units **(2 units for Research branch)**
  - Most options are 0.5 unit

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Optional Courses (a selection)

- **Probability theory**
  - Stochastic Processes
- **Statistical modelling and data analysis**
  - Multivariate Methods, Multilevel Modelling, Time Series,
  - Generalised Linear Modelling & Survival Analysis,
  - Longitudinal Data Analysis
- **Computational**
  - Computational Data Science
  - Machine Learning & Data Mining
  - Bayesian Machine Learning

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Research branch?

- 12 months, involves a dissertation (1 unit, 25%)
  - Choose topic from list (or develop own)
  - Work on throughout year

- Why?
  - Chance to work in-depth on subject of choice
  - Some projects with industry partner
  - Develop computing and analysis skills
  - Experience of research and report writing

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MSc Statistics (Social Statistics)

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What? Degree Structure

- **Compulsory**
  - ST425 Statistical Inference: Principles, Methods and Computation (F)
  - ST411 Generalised Linear Modelling and Survival Analysis

  - **One of:**
    - ST405 Multivariate Methods (H)
    - ST416 Multilevel Modelling (H)
    - ST442 Longitudinal Data Analysis (H)

  - **Research branch only:** ST499 Dissertation (F)

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What? Degree Structure

- **Options**
  - 2 units (1 unit for Research branch)
  - Most options are 0.5 unit

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What next? Careers

- **Statistics**
  - Any quant position!
  - Common destinations: finance sector, tech industry, public sector, research

- **Social Statistics**
  - All of the above, plus positions with a social science flavour:
    - Market or survey research
    - Government department, NGO
    - Social research (university)

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ESRC 1+3 Funding

- Enables students to do an MSc followed by a PhD in the Department of Statistics
- Available on MSc Data Science and the MSc Statistics (Research) programmes (all streams).
- Open to students from all nationalities
- If you would like to be considered, submit an application for relevant MSc programme, including a research proposal for the PhD element

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MSc Statistics (Financial Statistics)

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Why Financial Statistics?

- Statistical models/methods most related to finance
- Knowledge in finance; listed optional courses from the Finance department
- Data analytic/machine learning approach to modern problems in finance, estimation/forecast/interpretation

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Degree Structure

- **Compulsory**
  - ST425 Statistical Inference: Principles, Methods and Computation (F)
  - ST422 Time Series
  - ST436 Financial Statistics
  - **Research branch only**: ST499 Dissertation (F)

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Degree Structure

- **Options**
  - 2 units (1 unit for Research branch)

  - Most options are 0.5 unit, including courses offered by Department of Finance, e.g.,
    - FM402 Financial Risk Analysis (H)
    - FM413 Fixed Income Markets (H)
    - FM429 Asset Markets A (H)
    - FM441 Derivatives (H)

What next? Careers

- **Financial Statistics**
  - Mostly quant positions!
  - Common destinations:
    - finance sector, tech industry, or further study
    - E.g. Investment analyst, Equity trader, Asset manager, Risk controller, etc.

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MSc Quantitative Methods for Risk Management

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Degree Structure

- **Pre-sessional course:** MA400 in September

- **Thee core courses (half units):**
  - Stochastic Processes: ST409
  - Risk Management: ST429
  - Computational Methods: MA417

- **Five electives (half units):**
  - Stats and Data Science in Dept of Statistics
  - Financial Maths in Dept of Mathematics
  - Finance in Dept of Finance

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Career

- Banks
- Asset management firms
- Insurance and reinsurance companies
- Data analytics companies
- Consulting firms
- World-wide research institutions.

MSc Data Science

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Data Science is everywhere - $ 3 trillion revenue per year

- Games,
- Machine translation,
- Music, Movie, Product recommendation,
- Autonomous driving,
- Robotics,
- Social media,
- Search engines,
- Fraud detection,
- Email filtering,
- Route planning and navigation,
- Art,
- Healthcare,
- Finance,
- *and more!…*

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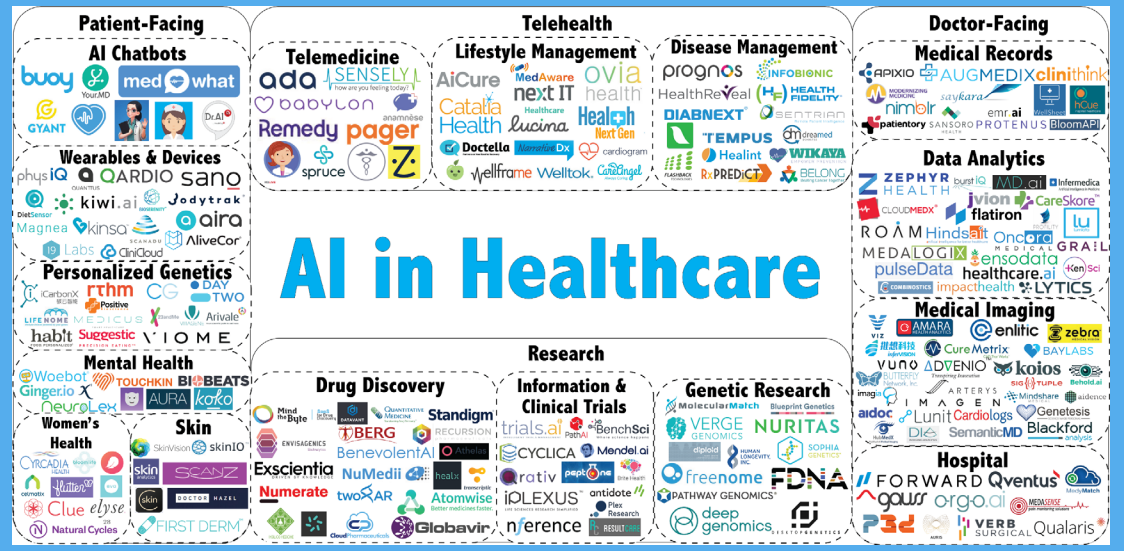
AlphaGo

DeepL

searX



What? Degree Structure (4.0 Units)

- **Compulsory**
  - ST443 Machine Learning and Data Mining (H)
  - ST445 Managing and Visualising Data (H)
  - ST447 Data Analysis and Statistical Methods (H)
  - ST498 Capstone Project (F)

  - **2.5 units**
    - 3 half-units (0.5) + 1 full unit (1.0) = 2.5 units

  - **Optional Courses: 1.5 units**

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What? Degree Structure (cont'd)

Data Science Options:

- ST444 Computational Data Science (H)
- ST446 Distributed Computing for Big Data (H)
- ST449 Artificial Intelligence (H)
- ST451 Bayesian Machine Learning (H)
- ST455 Reinforcement Learning (H)
- ST456 Deep Learning (H)
- ST457 Graph Data Analytics and Representation Learning (H)

What? Degree Structure (cont'd)

Other Statistics Options:

- ST405 Multivariate Methods (H)
- ST411 Generalised Linear Modelling and Survival Analysis (H)
- ST422 Time Series (H)
- ST429 Statistical Methods for Risk Management (H)
- ST436 Financial Statistics (H)
- ST454 Baysian Data Analysis

What? Degree Structure (cont'd)

Outside Options:

- MA407 Algorithms and Computation (H)
- MA424 Modelling in Operations Research (H)
- MY459 Quantitative Text Analysis (H)
- MY461 Social Network Analysis (H)
- MY470 Computer Programming (H)

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Capstone Projects: Real-world data science project with a company (Nov – Aug):

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MSc Health Data Science

Joint Programme with the Department of Health Policy

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Why study Health Data Science?

- A lot of Big data comes from healthcare, and it is getting bigger:
  - *Administrative (e.g. NHS)*
  - *Patient data (e.g. diagnostics, imaging)*
  - *Treatment data (e.g. Public Health, pharmaceuticals)*
  - *Private health care providers (e.g. insurance)*

- Now is a great time to get into this fast-paced multi-disciplinary field and make your mark.

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Why study Health Data Science at LSE?

- Best of both worlds.
- The MSc HDS is a joint programme run with the department of Health Policy.
- This means you get a strong foundation in both:
  - Data Science/Statistics techniques
  - Health Policy: quantitative and qualitative
- Giving you the bigger picture of this field.

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Degree Structure

- 9 Month Taught MSc programme
- 4 units composed of 8 half-unit modules
- 4 modules from Statistics and 4 from Health Policy

- Each course includes
  - Lectures
  - seminars or computer workshops

- Students are allocated Academic mentors in Department of Statistics or Department of Health Policy

Compulsory Courses

Autumn Term (Oct - Dec)
HP426: Applied Health Econometrics
ST445: Managing and Visualising data
ST447: Data Analysis and Statistical methods

Summer term - Exam period (May - June)

Winter Term (Jan – April)
HP434: Methods and Data for Health Systems Performance Assessment

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Optional Courses

Autumn Term (Oct - Dec)

ST443: Machine Learning and Data mining

ST449: Artificial intelligence

Winter Term (Jan – April)

ST451: Bayesian Machine Learning

ST446: Distributed Computing for Big Data

ST405: Multivariate Methods

ST416: Multilevel Modeling

ST454: Applied Spatio-temporal Analysis

ST456: Deep Learning

ST455: Reinforcement Learning

Summer term -Exam period (May - June)

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What next?

- **Graduates from last year went on to roles in:**
  - *GSK: Data Analytics*
  - *33n: Healthcare consultancy in London, working mainly with the NHS*
  - *UN Healthcare management and Occupational safety*
  - *Lane Clark and Peacock: Insurance*
  - *Swiss Institute of Bioinformatics*

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What next?

- **And we anticipate our graduates will go on to find jobs in:**
  - *International: World Health Organisation;*
  - *National: NHS, HPA and equivalents in other countries;*
  - *Private health care providers and insurers;*
  - *Pharmaceutical industry;*
  - *Academia/Private research firms.*

Q&A

A few points:

- *Please type questions in Q&A box*
- *The Department of Statistics is unable to answer any admissions queries.*
- *Detailed/specific questions – please submit at www.lse.ac.uk/ask-lse or via Student Marketing and Recruitment Live Chat*
- *Other sessions taking place on Applying to LSE, Financial Support and LSE LIFEhttps://www.lse.ac.uk/study-at-lse/meet-visit-and-discover-LSE/experience-lse/virtual-graduate-open-day*
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Contacts – Programme Directors

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“Thank you for attending our Virtual Graduate Open Day – please feel free to ask us any questions.”

SHOULD YOU HAVE ANY QUESTIONS AFTER THIS EVENT, PLEASE DO NOT HESITATE TO GET IN TOUCH WITH US AT STATS-MSC@LSE.AC.UK.