

**C**ENTRE FOR  
**C**OMPUTATIONAL  
**F**INANCE AND  
**E**CONOMIC  
**A**GENTS



Centre for  
Computational Finance  
and Economic Agents

**CCFEA**

Wivenhoe Park, Colchester CO4 3SQ, UK

# Welcome !

## Our Interdisciplinary MSc programmes:

- High Frequency Finance and Trading
- Computational Finance
- Financial Computing



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# MSc Programme Structure

Lectures & Labs (autumn & spring)

- 6 compulsory modules
- 2 optional modules

Assessment

- coursework (autumn & spring)
- written exams (summer)

Dissertation



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What we do ...

Interdisciplinary research

Applying methods and techniques **from computer science and engineering science** to solve real-world problems **in finance and economics** ...

**...HOW?**

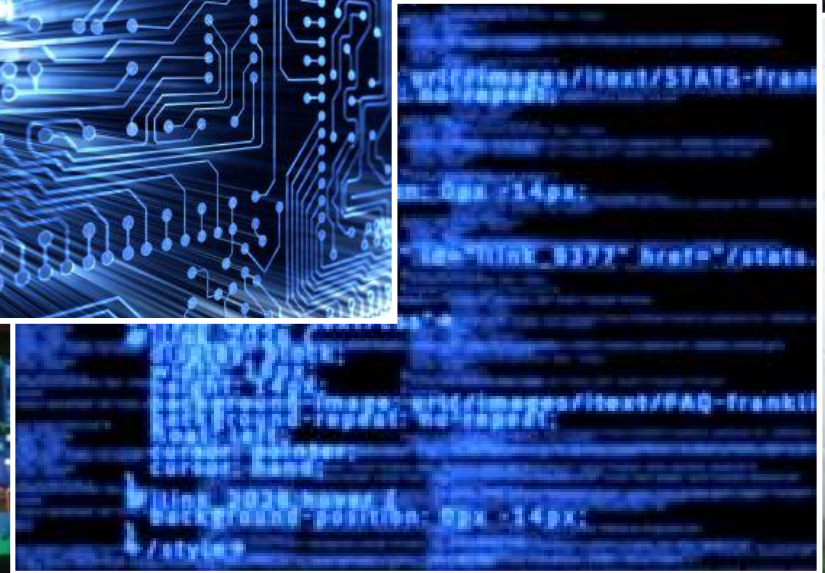
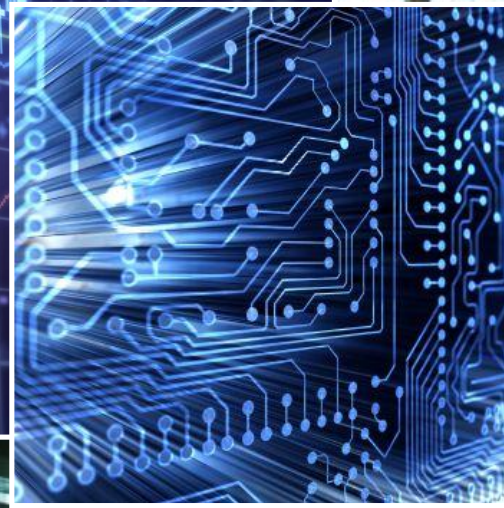


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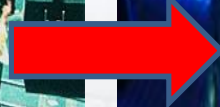
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# High-Frequency Finance & Trading



# The Idea:



... example ?



# What some ebay-traders love(d):



REUTERS EXPERT

FOR THE EXPERT VIEW  
ON FOREX



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## Snipers, sniffers, guerillas: the algo-trading war

 Recommend  Sign Up to see what your friends recommend.

By Jennifer Ablan  
NEW YORK | Thu May 31, 2007 5:00pm EDT

(Reuters) - Snipes, sniffers and guerrillas are lurking in the stock market. So are dark pools, daggers, boxers, slicers and nighthawks.

Reflecting the nature of the struggle for ascendance in algorithmic trading -- or simply, the algo wars -- investment banks and hedge funds have been giving military monikers to their increasingly complex and machine-driven trading strategies.

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# High-Frequency Finance & Trading

- Introduction to Financial Market Analysis
- Quantitative Methods in Finance and Trading
- Learning and Computational Intelligence in Economics and Finance
- Introduction to Agent-based modelling using OOP
- High Frequency Finance and Empirical Market Micro-Structure
- ...



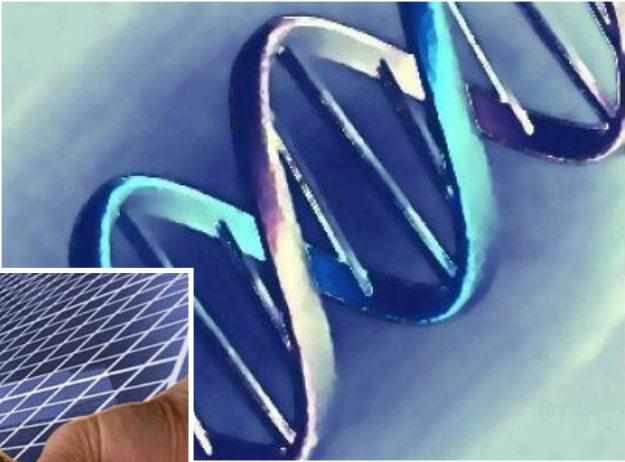
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# Computational Finance



# Computational Finance

- Mathematical Research Techniques using Matlab
- Introduction to Financial Market Analysis
- Quantitative Methods in Finance and Trading
- Learning and Computational Intelligence in Economics and Finance
- Financial Engineering and Risk Management
- Industry Expert Seminar
- ...

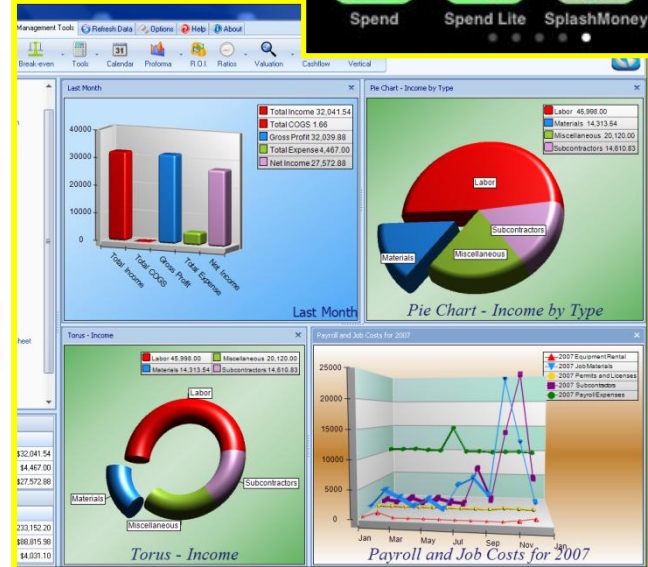


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# Financial Computing



# Financial Computing

- Underlying Technology in Financial Systems
- Advanced Relational and Object-Oriented Databases
- Software Design and Architecture
- Distributed Computing
- Introduction to Financial Market Analysis
- Financial Engineering and Risk Management
- Agent-Based Modelling in Finance & Economics
- ...



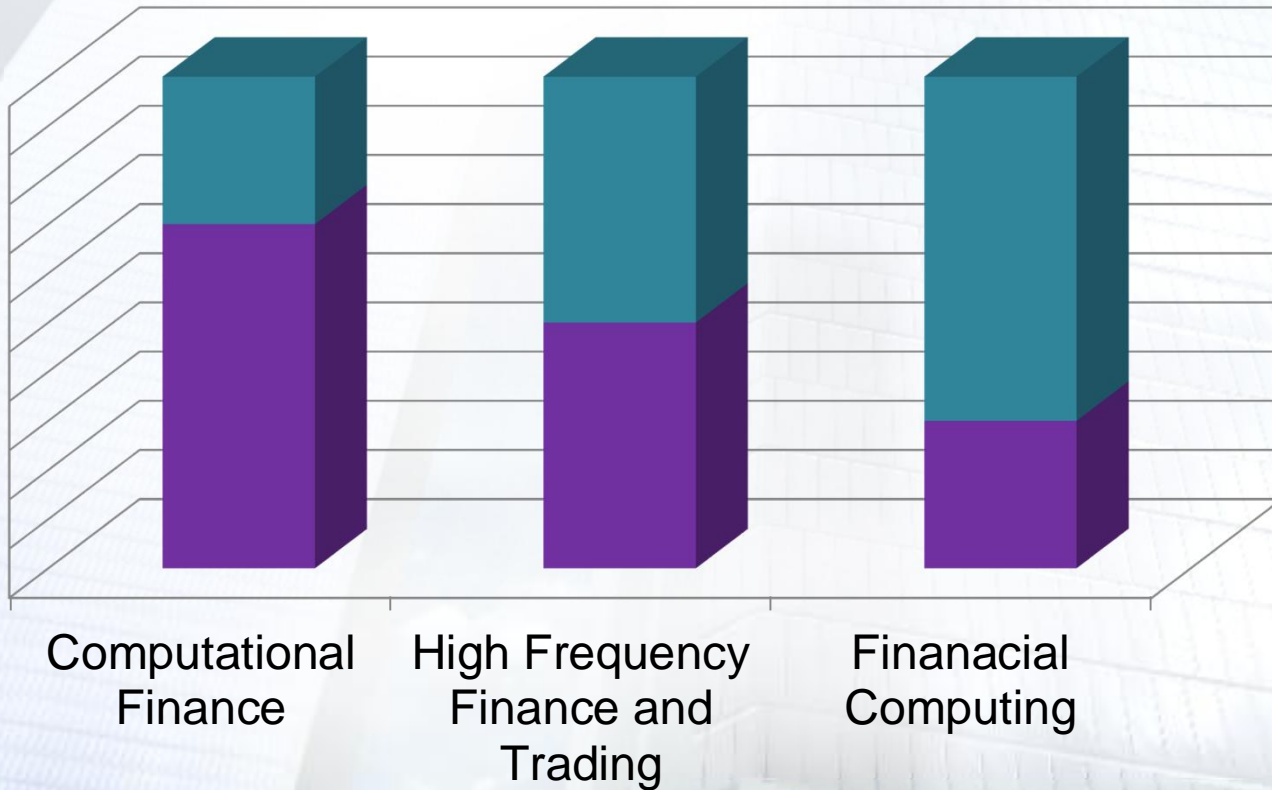
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# Balance

■ Computer Science & Engineering   ■ Finance & Economics



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# Employability?

## Hands-on & Relevant Curriculum:

- Teaching content reviewed by industry experts
- Industry expert lecture series
- MSc research projects  
(potential internships!)
- Alumni & industry contacts



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# MSc Entry Requirements

- **Computational Finance (CF)**: 2.1 or first class Bachelors degree in Engineering, Physics, Computer Science, Statistics, Mathematics or Quantitative Economics/Finance.
- **High-Frequency Finance and Trading (HFT)**: same as **CF**, however, knowledge of C++ or Java programming is desirable.
- **Financial Software Engineering (FSE)**: same as in **CF**, however, a high level of programming expertise in languages such as in C++, JAVA and/or .NET is required.



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# CCFEA MSc-alumni ...

## Where do they work now?

- Armajaro Holdings Ltd.
- Bank of America
- Deutsche Bank
- KPMG
- MarkitSERV
- Mitsubishi UFJ Securities
- Petrologica Ltd.
- Reuters
- SunGard Financial Systems
- ...

## What do they do?

- Clearing & Settlement
- Trading & Execution
- Investment Strategies
- Research Analyst
- Insurance
- Risk Assessment
- Portfolio Management
- ...



# PhD Entry Requirements

Entry to our **PhD programme in Computational Finance** requires applicants to have a

**Masters degree at distinction level** in Engineering, Physics, Computer Science, Statistics, Mathematics or Quantitative Economics/Finance.

OR

**2.1 or first class MSc degree in Computational Finance** (or similar).



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# Where do our PhD-alumni work now?

## Financial Industry:

- Alerio Capital
- Allianz Global Investors
- Bank of Japan
- Citigroup
- Columbian Central Bank
- Franklin Templeton
- HSBC
- ING Bank
- Legal & General
- Nomura Securities
- Mexican Central Bank
- Old Mutual Asset Management
- ...

## Academia:

- Basel, University of
- Bath, University of
- Birbeck, University of London
- Macau, University of
- Macquarie University, Sydney
- Malta, University of
- Monash University, Melbourne

# MORE?

<http://www.essex.ac.uk/ccfea/>



The screenshot shows the CCFEA website homepage. At the top left is the University of Essex logo. At the top right is the CCFEA logo and the text 'Centre for Computational Finance and Economic Agents'. Below the logo is a navigation bar with links: 'home | staff only | contact | search'. A large, semi-transparent 'CCFEA' watermark is in the background. Below the watermark is another navigation bar with links: 'about us | people | current students | prospective students | research'. The main heading is 'Welcome to CCFEA'. Below this is a paragraph of text describing the center's mission and activities. At the bottom, there is a 'Latest News' section with links to 'CCFEA MSc presentations', 'CCFEA Summer Party 2011', and 'More News...'. The background of the website is a blurred image of a computer keyboard and a hand typing.

University of Essex

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about us | people | current students | prospective students | research

university of essex > ccfea >

## Welcome to CCFEA

The Centre for Computational Finance and Economic Agents (CCFEA) is an innovative, interdisciplinary and laboratory based teaching and research Centre which is a showcase for cutting edge computational and evolutionary methods to simulate markets with artificially intelligent agents and to design real time trading and risk management systems. CCFEA hosts advanced workshops and **seminars** by experts in the area of Computational Finance and Economics. The centre currently has over 50 Masters and PhD students.

The Centre with its innovative **Msc Computational Finance, Msc High-Frequency Finance and Trading, Msc Financial Software Engineering, PhD Computational Finance** - can be considered to be the first to offer such a PG curriculum in the UK. CCFEA will remain committed to being a pioneer at the leading edge of IT and Artificial intelligence based modelling of markets with operationally relevant features. To this end, in addition to the pursuit of theoretical aspects of the subject, strong industry links are sought via its **City Associates Board**. A number of CCFEA PhD students have industry internships. CCFEA is currently "defining the subject area" by its multi agent simulators and modelling work which is disseminated via the web, research papers, journal articles, books and invited talks by CCFEA faculty members at high profile academic and industry workshops and conferences.

**Latest News:** [CCFEA MSc presentations](#) | [CCFEA Summer Party 2011](#) | [More News...](#)

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*... the “CCFEA After-Life” ...*



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# ... Partys ...



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# ... Outdoor Activities ...



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# Welcome to CCFEA !

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<http://www.bracil.net/>

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