

Πλήρες Βιογραφικό – Απόστολος Ν. Ρεφενές



Ο Απόστολος Ρεφενές (Bsc Mathematics & Computing 1984, PhD Computing 1987) είναι Καθηγητής Χρηματοοικονομικής στο Οικονομικό Πανεπιστήμιο Αθηνών. Έχει διατελέσει Αναπληρωτής Καθηγητής της Επιστήμης των Αποφάσεων και Διευθυντής του Προγράμματος Computational Finance στο London Business School, senior research fellow στο University College London, επισκέπτης καθηγητής στο Πανεπιστήμιο Αθηνών, επιστημονικός σύμβουλος στο Βρετανικό Υπουργείο

Εμπορίου και Βιομηχανίας και μέλος της υποεπιτροπής "Technology Foresight on Financial Services" του Βρετανικού Υπουργικού Συμβουλίου, Μέλος της Επιτροπής Ανταγωνισμού, Γενικός Διευθυντής της ΟΠΑΠ International, μέλος του ΔΣ της ΟΠΑΠ ΑΕ. Έχει διατελέσει επιστημονικός σύμβουλος σε πολλά χρηματοοικονομικά και πιστωτικά Ιδρύματα, όπως Morgan-Stanley, CitiBank, Barclays, Dresdner, BNP, Societe General, Smith New Court, Golden Cross, και άλλους οργανισμούς μεταξύ των οποίων και η Ευρωπαϊκή Επιτροπή.

Έχει δημοσιεύσει περισσότερες από 100 εργασίες, είναι συγγραφέας τριών βιβλίων, και έχει επιμεληθεί της έκδοσης τεσσάρων τόμων σε θέματα Χρηματοοικονομικής Μηχανικής. Αποδέκτης χρηματοδότησης για βασική έρευνα από δημόσιους και ιδιωτικούς Οργανισμούς της τάξεως των \$10 εκ. Associate editor των περιοδικών Intelligent Systems in Accounting and Finance, International Journal of Computational Intelligence & Organisations, guest editor του περιοδικού Journal of Forecasting, editor της σειράς βιβλίων Studies in Computational Finance (Kluwer), και μέλος της επιτροπής σύνταξης του περιοδικού Neural Computing & Applications. Ιδρυτής του διεθνούς Συνεδρίου Computational Finance το 1993 και στη συνέχεια διετέλεσε γενικός πρόεδρος (General Chair) στα συνέδρια NnCM-95, Computational Finance 1997 και Computational Finance 2000, International Chair για το κοινό συνέδριο IEEE/IAFE Computational Intelligence in Financial Engineering. Μέλος οργανωτικής επιτροπής σε πολυάριθμα άλλα διεθνή Συνέδρια μεταξύ των οποίων συμπεριλαμβάνονται τα: World Congress on Neural Networks, International Conference on Artificial Neural Networks, International Conference on Neural Information Processing Systems, Euromicro, the IEE annual conference on ANNS, ICANN, κ.λπ.

Η διδακτική του εμπειρία συμπεριλαμβάνει: Χρηματοοικονομική Διοίκηση, Οικονομετρία της Χρηματοοικονομικής, Μαθηματικά Χρηματοοικονομικής, και Υπολογιστική Χρηματοοικονομική. Η τρέχουσα διδακτική του δραστηριότητα συμπεριλαμβάνει τμήματα MBA, Masters in Finance και διδακτορικών φοιτητών στο London Business School και Masters in Financial Engineering στο Οικονομικό Πανεπιστήμιο Αθηνών. Στο παρελθόν έχει διδάξει σε Τμήματα MSc και BSc Πληροφορικής στο University College London. Έχει αναπτύξει και διδάξει αυτοδύναμα εντατικά προγράμματα σπουδών (short executive courses) σε financial econometrics, advanced quantitative methods, advanced data analysis και forecasting. Η διδακτική του δράση περιλαμβάνει πανεπιστημιακές διαλέξεις και εντατικά προγράμματα σπουδών σε περισσότερες από 20 χώρες στην Ευρώπη, Ασία, Βόρεια και Νότια Αμερική.

Η τρέχουσα έρευνά του σε Χρηματοοικονομική Διοίκηση, Financial Engineering και Computational Finance χρηματοδοτείται εν μέρει από δημόσιους φορείς, όπως ESRC, το DTI, IST και εν μέρει από μεγάλα χρηματοοικονομικά και πιστωτικά Ιδρύματα όπως, μεταξύ άλλων, Dresdner, Citibank, Schrodgers, Τράπεζα Ελλάδος, κ.λπ. Εργασίες του σε θέματα μεθοδολογίας, όπως Ταυτοποίηση Οικονομετρικών Υποδειγμάτων, Εκτίμηση Παραμέτρων, Οικονομετρικού Ελέγχου Πληρότητας και ευρύτερα θέματα Μεθοδολογίας Σχεδιασμού Νευρωνικών Δικτύων, έχουν γίνει αντικείμενο εκτεταμένων αναφορών και παραπομπών. Εφαρμοσμένη έρευνα συμπεριλαμβάνει: Τακτική Διαχείριση Κεφαλαίων,

Factor Models for Equity Investment, Dynamic Risk Management, Nonlinear Cointegration, Διαχείριση Συναλλαγματικού Κινδύνου, κ.λπ. Τα δημοσιεύματά του εμφανίζονται σε περιοδικά όπως Journal of Forecasting, Journal of Futures Markets, Journal of Risk Finance, IEEE Trans on Neural Networks, Neural Networks, Risk, κ.λπ. Επίκαιρες πτυχές του έργου του έχουν απασχολήσει τον περιοδικό επιστημονικό τύπο όπως Scientific American, The New Scientist, Nature, Risk, IEEE spectrum, και τον ημερήσιο τύπο όπως The Financial Times, The Times, The Independent, The Guardian, The Daily Telegraph, κ.λπ. Προσκεκλημένος ομιλητής σε πολυάριθμα διεθνή Συνέδρια & συμπόσια. Επωνύμως καταχωρημένος στο «who is who in the World».

ΠΡΟΣΩΠΙΚΑ ΣΤΟΙΧΕΙΑ

ΟΝΟΜΑ	Απόστολος Νικολάου Ρεφενές
ΤΗΛΕΦΩΝΟ	(++30 210) 82 03 670
ΗΜΕΡ. ΓΕΝ.	13 Δεκεμβρίου 1958

ΠΑΡΟΥΣΑ ΘΕΣΗ

Καθηγητής, Οικονομικό Πανεπιστήμιο Αθηνών

ΣΠΟΥΔΕΣ

PhD in Computer Science, University of Reading, (1987).
BSc (Hons) in Mathematics and Computing, University of North London, (1984).

ΑΚΑΔΗΜΑΪΚΗ ΠΕΙΡΑ

	RESEARCH
(1995 - 2000)	Associate Professor in Decision Science, London Business School
(1996 - 2000)	Director, Computational Finance Programme, London Business School
(1994 - 1996)	Director, NeuroForecasting Club, London Business School
(1989 - 1993)	Senior Research Fellow, University College London
(1987 - 1989)	Research Associate, University College London
(1994 - 1996)	Visiting Professor, University of Athens
(1994 - 1995)	Visiting Senior Research Fellow, London Business School
(1990 - 1992)	Visiting Science Advisor, Department of Trade & Industry
	ADMINISTRATIVE
(2003 - 2005)	Chair, Student Club, AUEB
(2001 - 2003)	Deputy Chair, Department of Management Science, AUEB
(1990 - 1991)	Chair, CEC Advanced Informatics in Medicine Working Group
(1990 - 1991)	Chair, DTI Mission to Assess Japanese FGCS Programme
(1989 - 1990)	Member, ESPRIT experts group for the Parallel Computing Action

ΕΠΑΓΓΕΛΜΑΤΙΚΗ ΠΕΙΡΑ

(2004 -2009)	Chief Executive, OPAP International Ltd.
(2004 - 2008)	Board Member, Hellenic Competition
(2004 - 2004)	Board Member, OPAP S.A., Non-Executive Director,
(1994 - 2000)	Panel Member, UK Cabinet Office, OST; Financial Services ForeSight
(1993 - 1999)	Chairman, Hughes Financial Analytics Ltd

EDITORIAL

Assoc. Editor	<u>Intelligent Systems in Accounting & Finance</u> , Wileys, (1998 -)
Assoc. Editor	<u>Int. Journal of Computational Intelligence & Organisations</u> , IJCIO (1995-)
Guest Editor	<u>Journal of Forecasting, Special Issue</u> , co-edited H.White, Vol. 17(1998)
Editorial Board	<u>Neural Computing & Applications Journal</u> , Springer Verlag, (1991 -)
Editor	<u>Neural Networks in the Capital Markets</u> , Wiley & Sons, <u>Book</u> (1995)
Editor	<u>Proc. First Int. Wrksp. "Neural Networks in the Capital Markets"</u> , (1993)
Series Editor	<u>Computational Finance</u> , Kluwer Academic, <u>Book Series</u> (1998 -)
Co-editor	<u>Decision Technologies for Financial Engineering</u> , WSP, <u>Book</u> (1997)
Co-editor	<u>Neural Networks in Financial Markets</u> , <u>Proc. NnCM96 WSP</u> , <u>Book</u> (1996)
Co-editor	<u>Decision Technologies in Computational Finance</u> , Kluwer, Academic <u>Proc. Computational Finance 1997</u> , <u>Book</u> (1998).

ΟΡΓΑΝΩΣΗ ΣΥΝΕΔΡΙΩΝ

General Chair	COMPUTATIONAL FINANCE 2000, London (May 2000).
General Chair	COMPUTATIONAL FINANCE 1997, London (October 1997).
General Chair	3rd International Conference on "Neural Networks in the Capital Markets", NnCM, London (Oct. 1995).
General Chair	International Workshop on "Neural Networks in the Capital Markets" London Nov. 18-19 (1993).
International Chair	Joint IEEE/IAFE Int. Conf. on "Computational Intelligence in Financial Engineering", New York, Spring 1995.
Session Chair	"Dynamical Systems in Financial Engineering", WCNN (1995):- World Congress on Neural Networks Washington DC (1995).
Session Chair	Sixth European Congress on Intelligent Techniques & Soft Computing, Non-Parametric Methods in Financial Econometrics, Aachen, Sept. 98.
Programme Committee	Computational Finance 1998, New York, NYU, Stern (1994 -)
Programme Committee	International ICSC Symposium on Soft Computing in the Financial Markets), June 1999, Rochester, NY, USA, (1999).
Programme Committee	Engineering Applications of Neural Networks (EANN'99), 13-15 September 1999, Warsaw, Poland.
Programme Committee	World Congress on Neural Networks, WCNN (1995 -)
Programme Committee	International Conference on Artificial Neural Networks, ICANN (1995-)
Programme Committee	International Conference on Neural Information Processing Systems, ICONIPS (1995 -)
Programme Committee	IEE International Conference on ANNS, IEE (1992 - 1996)

INVITED/PLENARY TALKS - Conferences

Keynote address	ICANN' 93, International Conference on Neural Networks, "Neural Networks in the Capital Markets", Amsterdam, (Sept. 1993).
Keynote address	NIPS' 93, "Non-linear methods in Financial Engineering", Denver, Colorado, (Dec. 1993).
Keynote address	IEEE, Int. Conf. Computational Intelligence, Perth, Australia (Nov. 95)
Invited Speaker	IIR Quantitative Portfolio Investment Techniques, London, (Oct. 1999).
Invited speaker	EQMC, Non-parametric Methods in Quantitative Marketing, Madrid, (July 1998).
Invited speaker	NnCM 96, (Neural Networks in the Capital Markets). Pasadena, CA, (Nov. 1996).
Invited speaker	ICONIPS96, (Int. Conf. on Neural Information Processing). Hong-Kong, (Sept. 1996).
Invited speaker	CIFer'95 (Computational Intelligence in Financial Engineering). The first joint IEEE/IAFE int. conference on the topic. NY, NY, (April 1995).
Invited speaker	RISK, Risk Conference on Model Risk, "Evaluating and Managing Model Risk in the Non linear Context", NY, NY (Oct. 1995).

Invited speaker

WCNN'94, World Congress on Neural Networks, "Neural Networks in Investment Management", San Diego June 1994.

Invited speaker	IBC, Fifth Annual Forum, Advanced Technologies for Trading & Asset Management, "Nonlinear Data Analysis and Forecasting in Investment Management:", New York July 20, 21 (1994).
Invited speaker	IBC, 5th Annual Symp., Intelligent Systems in Business & Finance, "Neural Networks in Financial Engineering", London Feb. (1994).
Invited speaker	IIR' 93, Institute for International Research, conference on "Software tools for portfolio management and trading", Frankfurt, (April. 1993).
Invited speaker	IIR' 93, Institute for International Research, conference on "Modernes Portfolio Management", Frankfurt, (Sept. 1993).
Invited discussant	Economic Notes (Risks Involving Derivatives), Sienna, (Dec. 1996).

Προσκεκλημένος ομιλητής σε πολλά άλλα συνέδρια και workshops στη Βρετανία και άλλες χώρες μεταξύ των οποίων Global Derivatives 95 (Paris), RISK (NY), BNCNN-95 (Curitiba, Brasil), NIPT-91 (Tokyo), IWIC (USSR), BCS, International Neural Networks Society, NCAF, IBC, Cambridge University "Advances in Options Research", κλπ).

ΔΡΑΣΤΗΡΙΟΤΗΤΑ ΚΡΙΤΗ (REFEREEING ACTIVITIES)

- UK Research Councils ESRC/EPSRC
- Commission of the European Communities ESPRIT
- Hong Kong University Grants Committee
- Cyprus University Grants Committee

- IEEE Trans. on Neural Networks
- IEEE Trans. on Knowledge and Data Engineering
- Neural Networks
- Neural Computation
- Neural Computing and Applications
- Neurocomputing
- Neural Information Processing Systems
- Pattern Analysis and Applications
- Computational Statistics & Data Analysis
- Management Science
- International Journal of Forecasting
- European Journal of Operational Research
- Computers and Operations Research
- Journal of Business Finance and Accounting
- Journal of Defence Economics
- Journal of Mathematics Applied to Business and Industry

RECENT MEDIA

Επίκαιρες πτυχές του έργου του έχουν απασχολήσει τον περιοδικό επιστημονικό τύπο όπως

- | | |
|----------------------------------------------|------------------------------------------|
| ◆ Scientific American | ◆ The Financial Times |
| ◆ The New Scientist | ◆ The Independent |
| ◆ Nature | ◆ The Guardian |
| ◆ Risk | ◆ The Daily Telegraph |
| ◆ IEEE spectrum | ◆ Machine Intelligence News |
| ◆ Canadian Business Magazine | ◆ Expert System Applications and others. |
| ◆ Journal of Global Investment | ◆ Listed in who-is-who in the World |
| <input type="checkbox"/> Managed Derivatives | |

ΣΥΜΒΟΥΛΕΥΤΙΚΕΣ ΥΠΗΡΕΣΙΕΣ (CONSULTING)

- CITIBANK
- Morgan Stanley
- Barclays BZW
- Credit Lyonnais
- Societe Generale
- Dresdner Bank
- Deutsche Morgan Grenfell
- Reuters Plc
- County NatWest Investment Management
- Smith New Court
- Golden Cross
- Bradford & Bigley Building Soc.
- Abbey National
- Barclays UKBS
- ECONOSTAT
- Shell
- IBM
- UK Department of Trade & Industry
- EU ESPRIT advisory board

ΔΙΔΑΚΤΙΚΗ ΠΕΙΡΑ

Executive Courses

- Mastering Advanced Quantitative Methods, Athens University of Economics and Business
- Financial Engineering and Risk Management, GC, Brazil
- Pricing Options, Futures and other Derivative Securities with Nonparametric Methods, Golden Cross
- Factor Models for Tactical Asset Allocation, Citibank, Singapore
- Advanced Quantitative Investment Methods, Forum, Frankfurt.
- Advanced Forecasting Methods for Financial Engineering, London Business School
- Neural Networks in Financial Economics, Int. Center for Monetary & Banking Studies, Geneva
- Tactical Asset Allocation, International Faculty of Finance, London

Graduate Courses

- Financial Mathematics (Stochastic Processes, stochastic flows and differential equations)
- Financial Econometrics (Time Series, ARCH/GARCH, State-Space Models, Neural Networks)
- Stochastic Optimisation and Genetic Algorithms
- Computational Finance (Numerical methods, Re-sampling, Monte-Carlo, Bootstrap Statistics)
- Uncertainty Analysis and Hypothesis Testing

Undergraduate Courses

- Foundations of Investment Management, HK
- International Investment Decisions in Emerging Markets, Singapore
- Systems Analysis, UCL
- Networks and Architectures, UCL
- Neural Networks, UCL

ΕΠΙΒΛΕΨΗ ΔΙΔΑΚΤΟΡΙΚΩΝ ΔΙΑΤΡΙΒΩΝ

- ◆ **Skitzis V.**, “Dynamic Correlation Models”, Athens University of Economics & Business, PhD, (2004).
- ◆ **Towers N.** “Evolutionary Methods for Decision and Risk Analysis in Active Investment management”, London Business School, PhD (2000).
- ◆ **Bolland P.**, “Robust Neural Estimation and Diagnostics”, PhD, London Business School, (June 1998).
- ◆ **Bentz Y.**, “Identifying and Modelling Conditional Factor Sensitivities: Applications in Equity Investment”, PhD, London Business School, (Nov. 1999).
- **Burgess A. N.**, A Computational Intelligence Methodology for forecasting noisy, non-stationary time-series, London Business School, PhD, (Nov. 1999).
- ◆ **Holt W.**, “Statistical Diagnostics and Test Procedures for Neural Models”, London Business School, PhD (Feb. 1999).
- ◆ **Pandelidaki S.**, “Neural and Econometric Models for Sales Forecasting”, London Business School, PhD (Nov. 1998).
- ◆ **Zapranis A.**, “A Methodology for Neural Model Identification, Variable Selection, and Adequacy Testing”, PhD, London Business School, (June 1997).
- ◆ **Azema-Barac M.**, “Parallel Neural Network Architectures”, PhD University College London, (1994).
- ◆ **Balou A.**, “A Basic Object Oriented Platform for the execution of high-level OO languages”, PhD University College London, (1995).
- ◆ **Oliveira C.**, “A Distributed Object-Oriented Machine for Parallel Processing”, PhD University College London (1994).

ΕΡΕΥΝΗΤΙΚΗ ΔΡΑΣΤΗΡΙΟΤΗΤΑ

Η ερευνητική δραστηριότητα του Α. Ρεφενέ αποτελείται από τρεις θεματικές ενότητες. Αρχίζει το 1984 με θέματα Τεχνολογίας Υπολογιστών και εξελίσσεται σταδιακά σε θέματα Τεχνολογίας των Αποφάσεων και την εφαρμογή της Διοικητικής Επιστήμης στον τομέα της Χρηματοοικονομικής. Η πρώτη θεματική ενότητα (την περίοδο 1987-1990) ξεκινά με τη Διδακτορική Διατριβή του και εστιάζει σε θέματα πληροφορικής και πιο συγκεκριμένα σε αρχιτεκτονικές υπολογιστών για Συστήματα Υποστήριξης Αποφάσεων (Decision Support Systems), όπως Knowledge based systems, Neural Networks, Object Oriented Environments. Η δεύτερη θεματική ενότητα (την περίοδο 1989-1992) εστιάζει σε Συστήματα Υποστήριξης Αποφάσεων και εφαρμογές σε τομείς όπως image understanding, voice recognition, medical diagnosis και database marketing. Η τρίτη θεματική ενότητα εστιάζει στην ανάπτυξη και εφαρμογή αυτών των συστημάτων και γενικότερα της Διοικητικής Επιστήμης στον τομέα της Χρηματοοικονομικής.

Η τρέχουσα ερευνητική δραστηριότητα στο Decision Technology Centre, London Business School αφορά θέματα μεθοδολογίας και εφαρμογής. Στο επίπεδο της μεθοδολογίας η έρευνα εστιάζει στην ανάπτυξη μη-γραμμικών μεθόδων για ανάλυση δεδομένων, προβλεψιμότητα και πρόβλεψη. Τα κύρια ερευνητικά θέματα καλύπτουν τα εξής:

- ◆ **Nonparametric models & machine learning:** εκτίμηση μη-παραμετρικών υποδειγμάτων και αλγόριθμοι εκμάθησης βασισμένοι στη μεθοδολογία των νευρωνικών δικτύων.
- ◆ **Model selection / specification:** μεθοδολογίες ταυτοποίησης νευρωνικών υποδειγμάτων και διάγνωση-ανάλυση υπολειμμάτων και οικονομετρικοί έλεγχοι για την πιστοποίηση πληρότητας μη-

γραμμικών υποδειγμάτων [identification procedures for misspecified neural network models; and diagnostics/residual analysis for non-linear model misspecification).

- ◆ **Hypothesis testing & confidence intervals:** ανάπτυξη θεωρητικών και εμπειρικών κατανομών για τον οικονομετρικό έλεγχο υποθέσεων και διαστημάτων εμπιστοσύνης για νευρωνικά υποδείγματα. (development of distribution theory for hypothesis testing and confidence intervals on parameter/variable significance estimation).
- ◆ **Robust model estimation:** διαδικασίες και αλγόριθμοι εκτίμησης και διάγνωσης - outlier- and leverage-resistant estimation procedures for neural models and diagnostics for outlier/leverage identification in the context of nonlinear models.
- ◆ **Parameter sensitivity & prediction uncertainty:** ευαισθησία μη-γραμμικών υποδειγμάτων και αξιοπιστία προβλέψεων - model sensitivity to sampling variance and parameter perturbations. Bounds for prediction uncertainty.
- ◆ **Nonlinear cointegration:** ανάπτυξη και ταυτοποίηση υποδειγμάτων μη-γραμμικής συνολοκλήρωσης - development and identification of nonlinear models with error correcting terms on cross-sectional as well as time series data.
- ◆ **Generalised Nonlinear Least Squares Models:** ανάπτυξη και εφαρμογή ειδικών μεθόδων GLS για μη γραμμικά υποδείγματα - development and application of GLS methods for nonlinear models to deal with problems of stationarity, level changes, etc.

Την τελευταία πενταετία ο Ρεφενές είναι αποδέκτης χρηματοδότησης για βασική έρευνα από δημόσιους και ιδιωτικούς οργανισμούς της τάξεως των \$10 εκ για την μελέτη και εφαρμογή της παραπάνω μεθοδολογίας αλλά και ευρύτερα της Διοικητικής Επιστήμης σε θέματα Χρηματοοικονομικής, όπως:

- ◆ **Factor Models for Tactical Asset Allocation:** τα υποδείγματα αυτά (Factor models) έχουν ευρεία χρήση στην στατική διαχείριση χαρτοφυλακίων. Το παρόν project επεκτείνει την χρήση των υποδειγμάτων στο χώρο της τακτικής διαχείρισης χαρτοφυλακίων (tactical asset allocation) όπου η διαφορά αποδόσεων μεταξύ ομολόγων, μετοχών και ρευστών μπορεί να εξηγηθεί μέσω των μεταβολών διαφόρων μακροοικονομικών μεγεθών. Η προσέγγιση διευρύνει την υπόθεση γραμμικότητας στην εξάρτηση και χρησιμοποιεί νευρωνικά υποδείγματα αντί γραμμικής παλινδρόμησης για να εξετάσει την εξάρτηση των σχετικών αποδόσεων (equity premium) από μεταβολές σε 17 μακροοικονομικούς παράγοντες. **With:** Postel (Hermes) Investment Management.
- ◆ **Arbitrage Models for Tactical Asset Allocation:** τα υποδείγματα αυτά (Statistical arbitrage models) αρχίζουν να αποκτούν ευρεία χρήση στην τακτική διαχείριση χαρτοφυλακίων σαν εναλλακτική προσέγγιση των factor models. Το παρόν project επεκτείνει την χρήση τους επιχειρώντας να αξιοποιήσει προσωρινές ανωμαλίες στις τιμές των ομολόγων και μετοχών. **With:** Societe Generale.
- ◆ **Factor Models for Equity Investment:** στη γραμμική τους μορφή, τα υποδείγματα αυτά (Factor models) έχουν ευρεία χρήση στην διαχείριση μετοχικών χαρτοφυλακίων. Το παρόν project διευρύνει την υπόθεση γραμμικότητας στην εξάρτηση. Χρησιμοποιούνται υποδείγματα νευρωνικών δικτύων για να μοντελοποιήσουν τη σχέση μεταξύ μετοχικών αποδόσεων και μακροοικονομικών μεγεθών όπως financial ratios και cyclicity indicators. Τα υποδείγματα εφαρμόζονται σε μετοχές του δείκτη CAC-40 και χρησιμοποιούνται για την δημιουργία χαρτοφυλακίων τα οποία είναι ουδέτερα (η κατ'επιλογήν ιδιαίτερος ευαίσθητα) σε μεταβολές επιλεγμένων παραγόντων. **With:** Societe Generale and Banque Nationale de Paris.
- ◆ **Nonlinear Cointegration in European Equity Futures:** αναπτύσσει μοντέλα μη-γραμμικής συνολοκλήρωσης στις ευρωπαϊκές αγορές μετοχικών αξιών. Συγκεκριμένα μεταξύ του δείκτη FTSE και άλλων δεικτών που συμπεριλαμβάνουν τους DAX, EoE, CAC, και SMI. Τα υπολείμματα της συνολοκλήρωσης μοντελοποιούνται σαν μη-γραμμική συνάρτηση διαφόρων εξωγενών μεταβλητών όπως (e.g. interest rate volatility, oil price changes, etc) οι οποίες επιλέγονται με την μέθοδο ANOVA και νευρωνική ανάλυση. **With:** CitiBank.

- ◆ **Forecasting Intra-day Volatility for Option Pricing:** μελετά μη-γραμμικά μοντέλα πρόβλεψης της τεκμαρτής μεταβλητότητας (implied volatility). Είναι από τις πρώτες εργασίες που εξετάζουν τη δυναμική της συνεπαγόμενης μεταβλητότητας σε υψηλή συχνότητα (i.e. intraday) και που εντοπίζουν τη μη-γραμμική εξάρτησή της από παράγοντες όπως: maturity effect, μεταβολές στις αποδόσεις του υποκείμενου τίτλου κλπ.. Τα συμπεράσματα της εργασίας αυτής έχουν σημαντικές συνέπειες για τους market makers. **With:** CitiBank.
- ◆ **Modelling Quarterly Returns on the FTSE-ALSH and S&P 500:** εξετάζει τη χρήση των νευρωνικών δικτύων σαν εναλλακτική προσέγγιση στην πρόβλεψη χρηματιστηριακών αξιών. Αποδεικνύεται ότι τα νευρωνικά δίκτυα προφέρουν καλύτερες προβλέψεις σε σχέση με την γραμμική παλινδρόμηση στην περίπτωση των τριμηνιαίων αποδόσεων του δείκτη FTSE All share. Το αποτέλεσμα αυτό σε συνδυασμό με την ανάλυση ευαισθησίας που επακολοιθεί, υποστηρίζουν την υπόθεση ύπαρξης μη γραμμικής σχέσης μεταξύ των αποδόσεων του δείκτη και μακροοικονομικών μεταβλητών σε αντίθεση με την γραμμική παλινδρόμηση η οποία αποτυγχάνει να αναγνωρίσει εμφανείς σχέσεις μη-γραμμικότητας. **With:** Henderson Administration.

Στην προηγούμενη θέση του σαν Senior Research Fellow στο University College London είχε την επίβλεψη πολλών άλλων ερευνητικών προγραμμάτων.

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