

# Anthony C. Constantinou

Curriculum Vitae, June 3, 2017

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<b>Languages:</b> Greek (Native), English (Fluent).	<b>E-mails:</b> <a href="mailto:anthony@constantinou.info">anthony@constantinou.info</a> & <a href="mailto:a.constantinou@qmul.ac.uk">a.constantinou@qmul.ac.uk</a>
	<b>Research Websites:</b> <a href="http://www.constantinou.info">www.constantinou.info</a> & <a href="http://www.pi-football.com">www.pi-football.com</a>

## EXPERIENCE

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- **Jan 2017 to Present: Lecturer (Assistant Professor)** in Machine Learning and Data Mining, Queen Mary University of London, UK.
- **Jul 2015 to Present: Decision Science Consultant.**  
*Bayesian networks for real-world decision making under uncertainty, for organisations world-wide and primarily in, but not limited to, the sports betting industry.*
- **Sep 2012 to Jan 2017: Post-Doctoral Research Fellow,**  
Queen Mary University of London, UK.  
*Worked on a) [NIHR](#) project on Bayesian networks for risk assessment and risk management in forensic psychiatry at Barts and The London School of Medicine and Dentistry (Sep 2012 – Jul 2014), and b) [ERC](#) project about improving evidence-based decision making for real-world critical decision problems using Bayesian network technology at the School of EECS (Jul 2014 to Jan 2017).*
- **Jul 2014 to Jul 2015: Associate Consultant (P/T),** Agena Ltd, London, UK.  
*Decision Science consultant using Bayesian network technology and visualisation to solve complex risky problems and improve decision making processes for customers world-wide and across a number of industry sectors.*
- **Oct 2009 to May 2013: Teaching Assistant (P/T),** Queen Mary University of London, UK.  
*Software Risk Assessment (BSc & MSc), Software Engineering (SE) and SE Theory (BSc & MSc), and Procedural Programming (BSc). School of EECS.*
- **Jun 2012 to Sep 2012: Decision Scientist (Internship),** Agena Ltd, London, UK.  
*Strategic planning and investment decision making.*
- **Oct 2009 to Sep 2012: PhD Researcher,** Queen Mary University of London, UK.  
*Bayesian networks for prediction, risk assessment and decision making. School of EECS.*
- **2000 to 2002 and 2004 to 2008:** Various summer jobs as web developer/sales assistant.
- **Jul 2002 to Aug 2004: Soldier,** Greek-Cypriot National Guard.

## QUALIFICATIONS

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- **2012: PhD in Bayesian Networks** at Queen Mary, University of London, UK.
- **2009: MSc (with Distinction) in Artificial Intelligence with Robotics,** University of Hertfordshire, UK.

- **2008: BSc** (Hons) in **Computer Science**, University of Hertfordshire, UK.
- **2012: Certificate** in **Probabilistic Graphical Models**, by Daphne Koller, Professor at Stanford University, USA (Coursera).
- **2012: Certificate** in **Game Theory**, by Matthew Jackson & Yoav Shoham, Professors at Stanford University, USA (Coursera).
- **2012: Certificate** in **Model Thinking**, by Scott E. Page, Professor at the University of Michigan, USA (Coursera).
- **2011: Certificate** in **Artificial Intelligence**, by Sebastian Thrun, Professor at Stanford University, and Peter Norvig, Director of Research at Google, USA (Coursera).
- **2011: Certificate** in **Machine Learning**, by Andrew Ng, Professor at Stanford University, USA (Coursera).
- **2009: Certificate** in **Electronic Engineering & Computer Science Teaching Skills**, Educational and Staff Development, University of London, UK.
- **2008: Certificate** in **CCNA Exploration: Network Fundamentals**. Cisco Networking Academy, UK.

## HONOURS, AWARDS & GRANTS

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- **2017:** Achieved 2<sup>nd</sup> position in the special issue competition *Machine Learning for Soccer*. Invited to submit a paper, which describes the model, in the **Machine Learning** journal.
- **2016:** Invited Programme Participant on *Probability and Statistics in Forensic Science*, Isaac Newton Institute for Mathematical Sciences, **University of Cambridge**, from 18/07/2016 to 21/12/2016.
- **2016:** Selected to present at the **SET for BRITAIN** research exhibition, Mathematical Sciences section, to the members of both **Houses of Parliament** held at the House of Commons, Parliament, Westminster, London, UK.
- **2013:** PhD thesis nominated by the school of EECS for the **CPHC/BCS Distinguished Dissertations 2013/2014 competition**, managed by *The council of Professors and Heads of Computing* (CPHC) and *British Computer Society* (BCS).
- **2012:** Grant of €1,000 by the Open University of Cyprus to work on the research project entitled "*Management of Myocardial infarction patients in Cyprus, Greece and Albania: A regional comparative study*".
- **2012:** **ImpactQM** scholarship and 3 months funding, from 01/06/2012 to 31/08/2012, by the **EPSRC Knowledge Transfer Account (KTA)** for training and industrial collaboration during PhD studies. *EPSRC KTA Scheme 1*, award of £4,798.
- **2009:** Full 3.5-year PhD scholarship and funding by the **EPSRC**. The award covered PhD tuition fees, plus a yearly stipend of £15,590.
- **2009:** Award of Distinction for MSc in Artificial Intelligence with Robotics by the University of Hertfordshire, UK.

## PEER-REVIEWING ACTIVITY *(ranked by distinct papers reviewed)*

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|---|---|
| [1] Knowledge-Based Systems (x6)                    | [14] Central European J. of Operations Research (x1)  |
| [2] Artificial Intelligence in Medicine (x4)        | [15] J. of Forensic Science & Legal Medicine (x1)     |
| [3] Expert Systems with Applications (x2)           | [16] Journal of the Operational Research Society (x1) |
| [4] Journal of Sport Sciences (x2)                  | [17] Journal of the Royal Society Interface (x1)      |
| [5] Decision Support Systems (x1)                   | [18] Engineering Sustainability (x1)                  |
| [6] Royal Statistical Society (x1)                  | [19] European Journal of Operational Research (x1)    |
| [7] Journal of Quantitative Analysis in Sports (x1) | [20] European Journal of Applied Mathematics (x1)     |
| [8] Journal of Risk and Reliability (x1)            | [21] Current Bioinformatics (x1)                      |
| [9] Journal of Applied Statistics (x1)              | [22] Sports (x1)                                      |
| [10] Journal of Forecasting (x1)                    | [23] Recent Patents on Computer Science (x1)          |
| [11] International Journal of Sport Finance (x1)    | [24] International Journal of Geo-Information (x1)    |
| [12] Int. J. of Sport Management and Marketing (x1) | [25] Environments (x1)                                |
| [13] Symmetry (x1)                                  | [26] Sustainability (x1)                              |

## PUBLICATIONS

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Google **h-index**: 9  
Google **i10-index**: 8

Up to date citation index can be found [here](#)

Publications are sorted by year of publication in subsections.

### JOURNALS

- [1] **Constantinou, A.**, & Fenton, N. (2017). The future of the London Buy-To-Let property market: Simulation with Temporal Bayesian Networks. *PLoS ONE*.
- [2] **Constantinou, A.**, & Fenton, N. (2017). Towards Smart-Data: Improving predictive accuracy in long-term football team performance. *Knowledge-Based Systems*, 124: 93-104. [[DOI](#), [draft](#)]
- [3] **Constantinou, A.**, Fenton, N., & Neil, M. (2016). Integrating expert knowledge with data in causal probabilistic networks: Preserving data-driven expectations when the expert variables remain unobserved. *Expert Systems with Applications*, 56: 197-208. [[DOI](#), [draft](#)]
- [4] Fenton, N., Neil, M., Lagnado, D., Marsh, W., Yet, B., & **Constantinou, A.** (2016). How to model mutually exclusive events based on independent causal pathways in Bayesian network models. *Knowledge-Based Systems*, 113, 39-50. [[Open Access DOI](#)].
- [5] **Constantinou, A.**, Fenton, N., Marsh, W. & Radlinski, L. (2016). From complex questionnaire and interviewing data to intelligent Bayesian models for medical decision support. *Artificial Intelligence in Medicine*, 60: 75-93. [[DOI](#), [draft](#)]  
*Discussed in [Atlas of Science](#). Also discussed in Prof. Fenton's [Probability and Risk](#) blog.*
- [6] Yet, B., **Constantinou, A.**, Fenton, N., Neil, M., Luedeling, E., & Shepherd, K. (2016). A Bayesian Network Framework for Project Cost, Benefit and Risk Analysis with an Agricultural Development Case Study. *Expert Systems with Applications*, 60: 141-155. [[DOI](#), [draft](#)].  
*Discussed in [CGIAR Water, Land and Ecosystems \(WLE\)](#).*
- [7] **Constantinou, A.**, Yet, B., Fenton, N., Neil, M., & Marsh, W. (2016). Value of Information analysis for Interventional and Counterfactual Bayesian networks in Forensic Medical Sciences. *Artificial Intelligence in Medicine*, 66: 41-52. [[DOI](#), [draft](#)].  
*Discussed in [Atlas of Science](#). Also discussed in Prof. Fenton's [Probability and Risk](#) blog.*
- [8] Coid, J. W., Ullrich S., Kallis, C., Freestone, M., Gonzalez, R., Bui, L., et al. (2016). Improving risk management for violence in mental health services: a multimethods approach. *Programme Grants for Applied Research*, 2016;4(16). [[DOI](#), [PDF](#)].

[9] **Constantinou, A.**, Freestone, M., Marsh, W., & Coid, J. (2015). Causal inference for violence risk management and decision support in Forensic Psychiatry. *Decision Support Systems*, 80: 42-55. [DOI, draft].

[10] **Constantinou, A.**, Freestone, M. F., Marsh, W., Coid, J., & Fenton, N. (2015). Risk assessment and risk management of violent reoffending among prisoners. *Expert Systems with Applications*, 42(21): 7511-7529. [DOI, draft].

*Discussed in Prof. Fenton's [Probability and Risk](#) blog.*

[11] **Constantinou, A.**, Fenton, N. E., & Pollock, L. J. H. (2014). Bayesian networks for unbiased assessment of referee bias in Association Football. *Psychology of Sport and Exercise*, Vol. 15, 5: 538-547. [DOI, draft].

*Discussed in [The Huffington Post](#) and in [Football Perspectives](#). Also discussed in Prof. Fenton's [Probability and Risk](#) blog.*

[12] **Constantinou, A.**, & Fenton, N. E. (2013). Profiting from arbitrage and odds biases of the European gambling market. *The Journal of Gambling Business and Economics*, Vol. 7, 2: 41-70. [PDF]

[13] **Constantinou, A.**, Fenton, N. E., & Neil, M. (2013). Profiting from an Inefficient Association Football Gambling Market: Prediction, Risk and Uncertainty Using Bayesian Networks. *Knowledge-Based Systems*, 50: 60-86. [Open Access DOI].

*Dedicated website: [PI-Football](#).*

[14] **Constantinou, A.**, & Fenton, N. E. (2013). Determining the level of ability of football teams by dynamic ratings based on the relative discrepancies in scores between adversaries. *Journal of Quantitative Analysis in Sports*. Vol. 9, Iss. 1, 37-50. [DOI, draft].

*Dedicated website: [PI-Football](#). Also discussed in Jona's [Opisthokonta](#) blog.*

[15] **Constantinou, A.**, Fenton, N. E., & Neil, M. (2012). pi-football: A Bayesian network model for forecasting Association Football match outcomes. *Knowledge-Based Systems*, 36: 322-339. [DOI, draft].

*Discussed in [CS4FN](#). Dedicated website: [PI-Football](#).*

[16] **Constantinou, A.**, & Fenton, N. E. (2012). Solving the Problem of Inadequate Scoring Rules for Assessing Probabilistic Football Forecast Models. *Journal of Quantitative Analysis in Sports*. Vol. 8: Iss. 1, Article 1. [DOI, draft].

*Discussed in Jona's [Opisthokonta](#) blog.*

## UNDER PEER-REVIEW

[17] Yet, B., Neil, M., Fenton, N., **Constantinou, A.**, & Dementiev, E. (2017). An Improved Method for Solving Hybrid Influence Diagrams. Under review, 2017.

[18] Yet, B., **Constantinou, A.**, Fenton, N., & Neil, M. (2017). Partial Expected Value of Perfect Information of Continuous Variables using Dynamic Discretisation. Under review, 2017.

[19] **Constantinou, A.** (2017). Dolores: A temporal mixture-method model for forecasting football match outcomes from all over the world. Under review, 2017.

## CONFERENCES & WORKSHOPS

[20] Fenton, N., **Constantinou, A.**, & Neil, M. (2017). Combining judgments with messy data to build Bayesian Network models for improved intelligence analysis and decision support. *In Proceedings of the 26<sup>th</sup> conference on Subjective Probability, Utility and Decision Making (SPUDM 26)*, Israel, August 20-24. [To appear]

[21] **Constantinou, A.**, & Fenton, N. (2016). Improving predictive accuracy using Smart-Data rather than Big-Data: A case study of soccer teams' evolving performance. *In Proceedings of the 13<sup>th</sup> UAI Bayesian Modeling Applications Workshop (BMAW 2016)*, 32<sup>nd</sup> Conference on Uncertainty in Artificial Intelligence (UAI 2016), New York City, USA, June 25-29, 2016, pp. 54-59. [PDF]

[22] **Constantinou, A.**, & Fenton, N. (2016). Smart data – not just big data: Real-world decision making with Bayesian networks. *SETforBRITAIN 2016*, Engineering and Mathematical Sciences Exhibition, House of Commons, Parliament, Westminster, London, UK, March 7, 2016. [poster]

[23] Yet, B., **Constantinou, A.**, Fenton, N., Neil, M., Luedeling, E., & Shepherd, K. (2015). Project Cost, Benefit and Risk Analysis using Bayesian Networks. *In Proceedings of the 12th UAI Bayesian Modeling Applications Workshop, 31st Conference on Uncertainty in Artificial Intelligence (UAI 2015)*, Amsterdam, Netherlands, July 12-16, 2015. [Abstract]

[24] Marsh, W., **Constantinou, A.**, Yet, B., & Fenton, N. (2014). Evidence synthesis for patient-specific decision support using Bayesian networks. *Life Sciences Conference: Population Health in a Post-Genomic Era*, London, UK, December 2014.

[25] **Constantinou, A.**, Freestone, M., & Coid, J. W. (2014). Development of a Bayesian network for violence risk management. *14th Annual Meeting of the International Association of Forensic Mental Health Services (IAFMHS)*, Toronto, Canada. June 2014.

- [26] Coid, J. W., **Constantinou, A.**, Freestone, M., Kallis, C., & Bui, L. (2014). Causal models for violence risk assessment and management: a new paradigm. *14th Annual Meeting of the International Association of Forensic Mental Health Services (IAFMHS)*, Toronto, Canada. June 2014.
- [27] **Constantinou, A.**, Freestone, M., & Coid, J. W. (2014). Using causal inference in risk analysis of violent re-offending among UK prisoners. *15<sup>th</sup> Annual Conference of the British and Irish Group for the Study of Personality Disorder (BIGSPD)*, Lincoln, UK. February 2014.

## ACADEMIC AND INDUSTRIAL TECHNICAL REPORTS AND OTHER

- [28] **Constantinou, A.** (2016). Generic Bayesian football predictions based on discrepancies in strength between adversaries. *Deliverable Technical Report for Venture Sports & Events Co. Ltd under Consulting Contract NO:20.SPORTS-BETTING.09/05/2016*.
- [29] **Constantinou, A.** (2016). Bayesian modelling and dynamic ratings for national football team assessment: The case of EURO 2016. *Deliverable Technical Report for Venture Sports & Events Co. Ltd under Consulting Contract NO:20.SPORTS-BETTING.09/05/2016*.
- [30] **Constantinou, A.** (2016). Extending Bayesian Networks and Dynamic Rating Systems to the German, French and Spanish football leagues. *Deliverable Technical Report for Venture Sports & Events Co. Ltd under Consulting Contract NO:19.SPORTS-BETTING.26/02/2016*.
- [31] **Constantinou, A.** (2016). An expert's guide to providing subjective inputs for Bayesian Network football models. *Deliverable Technical Report for Venture Sports & Events Co. Ltd under Consulting Contract NO:19.SPORTS-BETTING.26/02/2016*.
- [32] **Constantinou, A.**, Fenton, N., Marsh, W., & Radlinski, L. (2016). From complex questionnaires and interviewing data to intelligent Bayesian Network models. *Atlas of Science*, 2016. [[Online](#), [PDF](#)].
- [33] **Constantinou, A.** (2016). Algorithmic rating for determining the current level of football team performance. *Deliverable Technical Report for Venture Sports & Events Co. Ltd under Consulting Contract NO:18.SPORTS-BETTING.17/11/2015*.
- [34] **Constantinou, A.** (2016). Bayesian network modelling for betting decision making of the Under/Over 2.5 Goals Scored outcomes. *Deliverable Technical Report for Venture Sports & Events Co. Ltd under Consulting Contract NO:18.SPORTS-BETTING.17/11/2015*.
- [35] **Constantinou, A.** (2015). Managing the risk of model overfitting when parameterising complex Bayesian networks with football data. *Deliverable Technical Report for Venture Sports & Events Co. Ltd under Consulting Contract NO:18.SPORTS-BETTING.17/11/2015*.
- [36] Fenton, N., Neil, M., Lagnado, D., Marsh, W., Yet, B., & **Constantinou, A.** (2015). Modelling mutual exclusive events in Bayesian networks. Queen Mary, University of London. [[draft](#)]
- [37] **Constantinou, A.**, Yet, B., Fenton, N., Neil, M., & Marsh, W. (2015). What is the value of missing information when assessing decisions that involve actions for intervention? *Atlas of Science*, 2015. [[Online](#), [PDF](#)].
- [38] **Constantinou, A.** (2015). Bayesian network modelling for football match prediction of the Asian Handicap odds. *Deliverable Technical Report for Venture Sports & Events Co. Ltd under Consulting Contract NO:17.BETTING.21/7/2015*.
- [39] **Constantinou, A.**, Yet, B., Fenton, N., & Neil, M. (2015). Bayesian Modelling Framework for Planning and Evaluating Agricultural Development Projects. *Final Deliverable Report by Agena Ltd for ICRAF under Consulting Contract No. SD4/2012/214*.
- [40] Coid, J. W., Ullrich, S., Kallis, C., Freestone, M., Gonzalez, R., Bui, L., Igoumenou, A., **Constantinou, A.**, Fenton, N., Marsh, W., Yang, M., DeStavola, B., Hu, J., Shaw, J., Doyle, M., Archer-Power, L., Davoren, M., Osumili, B., McCrone, P., Barrett, K., Hindle, D., Bebbington P. (2015). Improving Risk Management in Mental Health Services – A Multi-Methods Approach. The *National Institute for Health Research (NIHR)*, UK 2015 [[draft](#)].
- [41] **Constantinou, A.**, Fenton, N. E., & Pollock, L. J. H. (2014). Bayesian networks for unbiased assessment of referee bias in football. *Football Perspectives*, 4 July, 2014 [[Online](#)].
- [42] **Constantinou, A.** (2013). Football: Win, Lose or Draw? *Computer Science For Fun (CS4FN)* [[Online](#)].
- [43] **Constantinou, A.** (2012). Bayesian Networks for Prediction, Risk Assessment and Decision Making in an inefficient Association Football gambling market. Ph.D Thesis, Risk & Information Management Research Group, School of Electronic Engineering and Computer Science, Queen Mary, University of London. Primary Supervision: [Prof. Norman Fenton](#), Secondary Supervision: Prof. Martin Neil. September 2012. [[Original version](#)] [[Restructured version](#) (easier to read)].
- [44] **Constantinou, A.** (2012). Professional business models based on football match odds. Technical Report for Agena Ltd, London, UK. August 2012.
- [45] **Constantinou, A.**, & Fenton, N. E. (2010). Evaluating the predictive accuracy of Association

Football forecasting systems. Queen Mary, University of London.

- [46] **Constantinou, A.** (2010). Football Match Predictions and Betting Strategies in Association Football Gambling Market. M.Phil to PhD Transfer Report. Risk Assessment and Decision Analysis Research Group, Electronic Engineering and Computer Science, Queen Mary, University of London.
  
- [47] **Constantinou, A.** (2009). Mathematical study of rational behaviour in Poker. MSc Thesis. Developed using C++. Department of Engineering and Information Sciences, University of Hertfordshire, UK, Supervised by [Dr. Daniel Polani](#). Grade: A.
  
- [48] **Constantinou, A.** (2008). Alpha-Beta in Computational Chess. BSc Final Year Project. Developed using C#. Department of Engineering and Information Sciences, University of Hertfordshire, UK, Supervised by [Dr. Daniel Polani](#). Grade: A.