IOANNIS FRAGKOS

Research Associate in Management Science
Department of Management Science and Innovation
University College London
London, WC1E 6BT, United Kingdom

+44 7762262186
i.fragkos@ucl.ac.uk

EDUCATION

HEC Montreal, Canada
Research associate in Operations Management, March 2015 – August 2015.

University College London (UCL), United Kingdom
Research associate in Data Analytics, January 2014 – December 2014.
Ph.D. in Management Science and Innovation, 2008 – 2013
Dissertation Title "*Large-Scale Optimisation in Operations Management: Algorithms and Applications*" (Graduation: December 2013).
Dissertation Committee: Prof. Bert De Reyck (UCL, Chair), Prof. Dolores Romero Morales (Said Business School, Oxford), Prof. Zeger Degraeve (Dean, Melbourne Business School, University of Melbourne), Prof. Rouba Ibrahim (UCL).

London School of Economics, United Kingdom
M.Sc. in Operational Research, 2006 – 2007 (Top 5%).

National Technical University of Athens, Greece
M.Sc. Industrial Engineering, 2004 – 2006 (1st out of 150).
B.Sc. Mechanical Engineering, 2001 – 2004 (7th out of 210).

RESEARCH FOCUS AND TEACHING INTERESTS

In my research I focus on issues in Data Analytics, Logistics and Transportation, and Project Management. My research is methodological in nature, and revolves around developing and applying novel large-scale optimisation methods, using Dantzig-Wolfe decomposition, Lagrange relaxation, Branch-and-Price and their integration with primal search procedures such as large-scale neighbourhood search. In addition, I apply the above methodologies to real-life large-scale operations management problems such as maritime transhipment operations and production planning; in this context have worked with the Noble Group on optimising their logistics operations. During my time as research associate, I have been working on data analytics, using machine learning models such as logistic regression, decision trees and random forest. Recently, I have also begun working in the area of project management, were I investigate how behavioural theories can explain typical planning fallacies and what methods can be employed to reduce their impact; this work is done in collaboration with the UK Department for Transport and Network Rail.

SUBMISSIONS TO REFEREED JOURNALS AND WORKING PAPERS

"Period Decompositions for the Capacity Constrained Lot Size Problem with Setup Times" (with S. Araujo, B, De Reyck, Z. Degraeve, and R. Jans), accepted in *INFORMS Journal on Computing*.

"Local Cuts and Two-Period Convex Hull Closures for Big-Bucket Lot-Sizing Problems" (with K. Akartunali, A. J. Miller and T. Wu), under review.

"A Horizon Decomposition approach for the Capacity-Constrained Lot Size Problem with Setup Times" (with Z. Degraeve and B. De Reyck), under review.

"The Noble Group improves its Maritime Transshipment Operations using Operations Research" (with B. De Reyck), invited for submission and under second round of review in *Interfaces*.

"Optimizing Maritime Transshipment Operations for the Noble Group" (with B. De Reyck), under preparation.

"Overcoming the Planning Fallacy: Evidence from the UK Department for Transport and Network Rail" (with Y. Gruska-Cockayne, B. De Reyck and D. Read), data analysis in progress.

"Vungle improves its revenue stream by applying sophisticated Data Analytics" (with Yael Gruska-Cockayne, B. De Reyck and Casey Lichtendahl), business case and manuscript under preparation.

TEACHING EXPERIENCE

London Business School, 2009 – 2014. Teaching assistant.

- *Project Management* (Instructor: Bert De Reyck; MBA, Executive MBA, Global Executive MBA).
- *Decision Models* (Instructor: Bert De Reyck; Global Executive MBA).
- *Operations Management* (Instructors: K. Ramdas, N. Bakshi; MBA).
- *Data Analytics for Management* (Instructors: C. Stefanescu, K. Fridgeirsdottir; MBA).

London School of Economics, 2009 – 2015. Guest lecturer. Overall course evaluation: 4.6/5.

- *Techniques of Operational Research* (Instructor: K.P. Papadaki; MSc Operational Research).
- *Foundations of Mathematical Programming* (Instructor: G. Zambelli, MSc Operational Research).
- *Mathematical Programming* (Instructor: L. Porkolab, MSc Operational Research).

University College London, 2009 – 2011. Teaching assistant.

- *Decision and Risk Analysis* (Instructor: Bert De Reyck, MSc Management).
- *Project Management* (Instructor: Bert De Reyck, MSc Technology Entrepreneurship).

Case Study: *A/B Testing at Vungle* (with Yael Gruska-Cockayne, B. De Reyck and Casey Lichtendahl).

APPLIED RESEARCH

The Noble Group, 2012 – 2013

The Noble Group is one of the biggest players in commodity trading worldwide. We modelled, solved and deployed a decision support tool for maritime scheduling of Noble's coal transhipment operations in Asia. The main implementation components are (i) a knapsack-based barge allocation model (ii) a single-vessel decomposition procedure and scheduling algorithm and (iii) a local search procedure that iteratively improves the generated schedules. The Noble Group reports significant savings since the implementation of the developed framework (joint work with B. De Reyck, UCL).

Great Ormond Street Hospital, 2014 – Present

Development of intelligent decision support systems that aid in medical decision making (joint work with B. De Reyck, UCL)

The UK Department for Transport and Network Rail, 2013 – Present

The planning fallacy is defined as the tendency of individuals to underestimate the duration and cost of tasks and overestimate their benefits. Drawing from psychological theories, we investigate the existence and magnitude of the planning fallacy as demonstrated by cost estimation data on rail projects. We further suggest procedures that reduce the impact of the planning fallacy and improve the forecasting accuracy of project planners (joint work with B. De Reyck, UCL, Y. Grushka-Cockayne, Darden School of Business and D. Read, Warwick Business School).

Vungle Inc, 2012 - 2014

Data Analytics for online advertising. Vungle provides an advertising platform that bridges two types of stakeholders: *publishers*, developers of well-established mobile applications aiming to monetise idle time slots found within their applications, and *advertisers*, developers of new applications who want to expose their product or service to their audience of interest. We analysed Vungle's big data (> 10 million rows per day) and developed a multi-level logistic regression model that increased the revenue per advertisement by more than 50%. I also recruited and lead the first internal data science team (joint work with B. De Reyck, UCL, Y.Grushka-Cockayne and C. Lichtendahl, Darden School of Business, Hammod Guerin, Vungle Inc and Andrew Kritzer, LindkedIn).

London Business School, 2009 – 2012
Creation of MBA study groups for each year's intake using mathematical modelling. To solve this problem, which is not tractable using start-of-the-art solvers, I applied pre-processing and a decomposition procedure, combined with a user-friendly spreadsheet interface.

CONFERENCE PRESENTATIONS

"A computational study of the local cuts from two-period convex hull closures for big-bucket lot-sizing problems"

- *International workshop on Lot Sizing*, Porto, 2014.

"Optimising Maritime Transhipment Operations for the Noble Group".

- *INFORMS Annual Meeting*, Minneapolis, 2013.
- EURO – INFORMS conference, Rome, 2013.
- POMS international conference, Singapore, 2014.

"A Horizon Decomposition approach for the Capacity-Constrained Lot Size Problem with Setup Times".

- *INFORMS Annual Meeting*, Phoenix, 2012.
- *International Workshop on Lot Sizing*, Rotterdam, 2012
- *International Symposium on Combinatorial Optimization*, Oxford, 2012.

"Period Decompositions for the Capacity Constrained Lot Size Problem with Setup Times".

- *European Conference on Operational Research*, Lisbon 2010.
- *International Workshop on Lot Sizing*, Istanbul, 2011

PROGRAMMING SKILLS

Languages: FORTRAN 77, C++, Visual Basic, Python (+Numpy, Pandas, Scikit-learn), JavaScript, R, MatLab.

Optimization packages: AIMMS, AMPL, LINGO, OPL, MOSSEL.

Other: CPLEX, GUROBI, XPRESS-MP, GitHub, Ubuntu, Latex, Excel VBA (power user).

REFERENCES

Bert De Reyck
Professor and Head of Department
Department of Management Science and Innovation
University College London
bdereyck@ucl.ac.uk

Yael Cockayne
Assistant Professor
Darden School of Business
University of Virginia
GrushkaY@darden.virginia.edu

Zeger Degraeve
Dean
Melbourne Business School
Melbourne University
Z.Degraeve@mbs.edu

Raf Jans
Professor
Department of Logistics and Operations Management
HEC Montréal
raf.jans@hec.ca