

# Teaching and Research Curriculum Vitae of Prof. Vittorio Moriggia

## HIGHER EDUCATION AND GRADUATE STUDIES

July 1993 Degree (*laurea*) received, in Business and Economics, University of Bergamo (Italy), dissertation “An automatic system for the analytical representation of a production process”.

1994-1997, Ph.D. scholarship in “Computational methods for financial and economic forecasting and decisions”, at the University of Bergamo, dissertation “Dynamic portfolio management and sensitivity analysis”.

1995-1996 Exchange Doctoral Student; Olin Business School, Washington University St. Louis, MO.

## ACADEMIC HISTORY AND TEACHING EXPERIENCE

- Associate professor in Financial Mathematics and Computer Science for Economics: since 2002, University of Bergamo (16Feb2002). Teaching:
  - Since 2020:
    - MATLAB for Decision Maker (in English) at the Dept. of Business, Economics and Quantitative Methods.
    - Coding for Data Science (in English) at the Dept. of Business, Economics and Quantitative Methods.
    - Computer Science at the Dept. of Business, Economics and Quantitative Methods.
    - Management Information System at the Dept. of Business, Economics and Quantitative Methods.
    - Computer Science at the Dept. of Engineering.
  - In 2019: MATLAB for Decision Maker (in English), Computer Science, Management Information System, Python course (in English) at the Dept. of Business, Economics and Quantitative Methods. Computer. Computer Science at the Dept. of Engineering.
  - From 2016 to 2019: MATLAB for Finance (in English), Computer Science, Information Technology for Finance at the Dept. of Business, Economics and Quantitative Methods. Computer Science at the Dept. of Engineering.
  - In 2015: MATLAB for Finance (in English), Computer Science, Information Technology for Finance at the Dept. of Business, Economics and Quantitative Methods. Computer Science at the Dept. of Engineering, Programming Languages at the PhD school.
  - From 2011 to 2015: MATLAB for Finance (in English), Computer Science, (Dept. of Economics and Business), Information Technology for Finance
  - Previous years: Information Technology for Finance – Advanced, Computer Science, Algorithms and Programming Techniques, Financial Engineering I, Introduction to GAMS (at SP-school 2009), Algorithm and Programming (PhD course), Networks and Network Issues, C++ and Object Oriented Programming (OOP), • VBA in Excel.
- Assistant professor in Financial Mathematics: 1998 - 2002, University of Bergamo (1Jan1998). Teaching similar courses.

## FIELDS OF RESEARCH

- Stochastic Optimization and Stochastic Dominance in Energy
- Pension Fund Management
- Property and Casualty Management
- Personal Asset Liability Management
- Dynamic stochastic programming in portfolio management, sensitivity analysis, contamination technique and scenario reduction
- Scenario generation for stochastic programming in Finance
- Option Implied trees
- Logical Analysis of Data (LAD) in credit risk

## RESEARCH ACTIVITY ABROAD

- 2010 (July - August) Visitor Scholar at Thunderbird School of Global Management, Glendale, AZ (USA).
- 2008 (July - August) Visitor Scholar at the Department of Finance, W.P. Carey School of Business, Arizona State University (ASU), Tempe, AZ (USA).

- 2001 (July - August) Visitor Scholar at Rutgers Center for Operations Research (RUTCOR), Rutgers State University of New Jersey, New Brunswick, NJ (USA).

## OTHER ACCADEMIC ACTIVITIES

- 2017 - now, member of scientific board of PhD doctoral course on “Analytics for Economics and Management (AEM)” of University of Brescia.
- 2012 - now, web editor for the Euro-Working Group on Stochastic Optimization (EWG-SO).
- 2013- 2019, member of scientific board of PhD program on “Analytics for Economics and Business (AEB)” of University of Bergamo.
- 2002 - 2005, member of Academic Senate as associate professors representative.
- 2003- 2009, member of scientific board of PhD program on “Computational methods for financial and economic forecasting and decisions” of University of Bergamo.
- 2001 - 2005, Head of learning and teaching for young unemployed, funded by Lombardy Region and European Union.
- Assistant Professors representative on the Faculty Council.

## RESEARCH PROJECTS

- **Research coordinator** for the following projects:
  - ❖ 2020, “Stochastic Dominance Applied to stochastic optimization problem in pension fund””, granted by Fondi di Ateneo MIUR ex-60%.
  - ❖ 2019. “Multi-stage Stochastic Dominance applied to portfolio selection”, granted by Fondi di Ateneo MIUR ex-60%.
  - ❖ 2017-2018. “Stochastic Dominance Applied to Asset-Liability Management Dynamics”, granted by Fondi di Ateneo MIUR ex-60%.
  - ❖ 2016. “Portfoglio replication and Monte Carlo simulation comparison in Pension Fund liability pricing and evolution”, granted by Fondi di Ateneo MIUR ex-60%.
  - ❖ 2015-2016. “DYNAMIC OPTIMIZATION TOOL FOR PENSION FUND MANAGEMENT – DEVELOPMENT OF DAPO FOR PF V2.0”, granted by AIM SE - Allianz Investment Management SE.
  - ❖ 2013-2014, "Dynamic Stochastic Models in Property and Casualty Management", granted by Fondi di Ateneo MIUR ex-60%.
  - ❖ 2011-2012, "Stochastic Programming in Property and Casualty", granted by Fondi di Ateneo MIUR ex-60%.
  - ❖ 2010-2011, "Stochastic Programming For Individual ALM", granted by Fondi di Ateneo MIUR ex-60%.
  - ❖ 2009 - 2010, "Kelly Optimization Model in Finance", granted by Fondi di Ateneo MIUR ex-60%.
  - ❖ 2008 - 2009, "Strumenti di supporto ai rischi finanziari", granted by Fondi di Ateneo MIUR ex-60%.
  - ❖ 2007 - 2008, "Misurazione e controllo del rischio di credito per portafogli di titoli esposti a rischio di default", PRIN 2005 (MIUR ex-40%), local unit coordinator V. Moriggia, national coordinator C. Torricelli.
  - ❖ 2005-2006, “Metodi quantitativi per la valutazione di titoli a reddito fisso soggetti al rischio di mercato e al rischio di credito”, PRIN 2004 (MIUR ex-40%), local unit coordinator V. Moriggia, national coordinator G. Szego.
  - ❖ 2007 - 2008, "Strumenti quantitativi nel rischio d'insolvenza", granted by Fondi di Ateneo MIUR ex-60%.
  - ❖ 2006 - 2007, "Rating di recuperabilità dei finanziamenti retails", granted by Fondi di Ateneo MIUR ex-60%.
  - ❖ 2005 - 2006, "Strumenti di supporto alle decisioni finanziarie", granted by Fondi di Ateneo MIUR ex-60%.
  - ❖ 2004 - 2005, "L'analisi logica dei dati nel rischio di credito", granted by Fondi di Ateneo MIUR ex-60%.
  - ❖ 2004, “Realizzazione di un software per l'applicazione dell'Analisi Logica dei Dati”, granted by Lince SpA, (**private funds**).
  - ❖ 2003 - 2004, "Costruzione di alberi di evoluzione di titoli attraverso il mercato delle opzioni in assenza di put-call parity", granted by Fondi di Ateneo MIUR ex-60%.
  - ❖ 2002 - 2003, "Impiego dell'analisi logica dei dati nel rischio d'insolvenza", granted by Fondi di Ateneo MIUR ex-60%.

- **Research participant** of following projects:
  - ❖ Nov2018-Mar2019, “Dynamic Simulation Tool for P&C 4.0”, granted by Allianz Investment Management (AIM) SE Munich (Germany), Allianz Group (**private funds**).
  - ❖ Nov2015-Oct2016, “Dynamic Optimization Tool for Pension Fund Management 2.0”, granted by Allianz Investment Management (AIM) SE Munich (Germany), Allianz Group (**project leader of private funds**).
  - ❖ Nov2015-Oct2016, “maintenance of Dynamic Optimization Tool for Pension Fund Management and P&C”, granted by Allianz Investment Management (AIM) SE Munich (Germany), Allianz Group (**project leader of private funds**).
  - ❖ Nov2014-Apr2015, “Allianz Pension Fund ALM Model”, granted by Allianz Investment Management (AIM) SE Munich (Germany), Allianz Group (**private funds**).
  - ❖ 01Oct2011-31Mar2012, “P&C Dynamic Optimization Tool 2”, granted by Allianz Investment Management (AIM) SE Munich (Germany), Allianz Group (**private funds**).
  - ❖ 01Oct2011-31Mar2012, “P&C Dynamic Optimization Tool 2”, granted by Allianz Investment Management (AIM) SpA Milan (Italy), Allianz Group (**private funds**).
  - ❖ 01Oct2010-30Sep2011, “P&C Dynamic Optimization Tool”, granted by Allianz Investment Management (AIM) SE Munich (Germany), Allianz Group (**private funds**).
  - ❖ 01Oct2010-30Sep2011, “P&C Dynamic Optimization Tool”, granted by Allianz Investment Management (AIM) SpA Milan (Italy), Allianz Group (**private funds**).
  - ❖ 18May2009-16Oct2009, “Personal AIM”, granted by Allianz Investment Management (AIM) SpA Milan (Italy), Allianz Group (**private funds**).
  - ❖ 2008-2009, “Gestione dinamica di portafogli finanziari ed efficienza computazionale: un’analisi comparativa”, PRIN2007 (MIUR ex-40%), National coordinator G. Consigli.
  - ❖ 2003, High-level scientific conferences on “Mathematical optimization methods for financial institutions”, sponsored by EEC on program “Improving Human Research Potential and Socio-Economic Knowledge Base, HPCF-CT-2002-00011, local coordinator M. Bertocchi, International coordinator S.A. Zenios.
  - ❖ 2002-2003, “Reti neurali per la valutazione del rischio di credito e la gestione del portafoglio crediti”, Programma Metodi e Sistemi di supporto alle decisioni – Legge 95/95, National coordinator M. Bertocchi.
  - ❖ 2002-2003, “Metodi e tematiche per l’ottimizzazione di portafoglio e per la valutazione di strumenti finanziari”, MIUR 40%, National coordinator M. Bertocchi.
  - ❖ 1998, "Analisi e sviluppo di metodi matematico-computazionali per la gestione di problemi finanziari", granted by CNR n. 98.01404.ct10.
  - ❖ 1997, "Analisi e sviluppo di metodologie per applicazioni ai mercati finanziari: aspetti computazionali", granted by CNR n. 97.01205.ct10.
  - ❖ 1997, "Modelli matematici applicati alle banche e alla finanza", granted by MURST 60%.
  - ❖ 1996-1997, "Analisi di sensitività in problemi di gestione di portafogli di titoli", granted by MURST 40%.
  - ❖ 1996, "Analisi e sviluppo di metodologie per applicazioni ai mercati finanziari", granted by CNR n. 96.01313.ct10.
  - ❖ 1995, "High Parallel Computing to finance", International coordinator prof. Stavros Zenios, University of Cyprus, granted by Economic European Community (EEC) Directorate General III n. 951139 INCO '95.
  - ❖ 1994, "Nuove metodologie informatiche per applicazioni ai mercati finanziari", granted by CNR n. 94.00538.ct11.
  - ❖ 1992, "Gli effetti economici del cambiamento tecnico", granted by CNR n. 92.01912.ct10, scientific coordinator prof. M. Morroni.
- Conference and school organizing committee:
  - ❑ May 30-31, June 1, 2017, “Conference on Computational Management Science”, member of organizing committee.
  - ❑ 8-12 July 2013, "International Conference on Stochastic Programming 2013, SP XIII", member of organizing committee.
  - ❑ November 2009, "Stochastic Programming School: Theory and Applications", member of organizing committee.

- 26 May 2008, Final Workshop of project PRIN 2005 n. 2005139555, "Il capitale della banca nella gestione del rischio e nelle strategie di investimento", National scientific coordinator Prof. Costanza Torricelli, local scientific coordinator and organizer Prof. V. Moriggia.
- 10-20 April 2007, "Spring School on Stochastic Programming: Theory and Applications", member of organizing committee.

## REFEREEING

- Annals of Operations Research
- Computational Management Science
- Economic Modelling
- IEEE Technology and Engineering Management
- International Journal of Financial Studies
- IMA Journal (guest ed.)
- Journal of Economic Dynamics & Control
- Kibernetika
- Management Engineering and Informatics
- Mathematical Reviews (AMS division) database reviewer

## EDUCATIONAL BOOKS

[https://www.libreriauniversitaria.it/libri-autore\\_moriggia+vittorio-vittorio\\_moriggia.htm](https://www.libreriauniversitaria.it/libri-autore_moriggia+vittorio-vittorio_moriggia.htm)

- Agostino Lorenzi, Vittorio Moriggia, Enrico Cavalli. Linguaggio Python. Per le Scuole superiori. Con e-book. Con espansione online - Atlas – 2019
- Agostino Lorenzi, Vittorio Moriggia. Pro.tech. Per le Scuole superiori. Con e-book. Con espansione online. Con DVD-ROM vol.A - Atlas – 2019
- Agostino Lorenzi, Vittorio Moriggia. Pro.Sia informatica e processi aziendali. Linguaggio C++. Per la 3<sup>a</sup> classe delle Scuole superiori. Con ebook. Con espansione online - Atlas – 2018
- Agostino Lorenzi, Vittorio Moriggia, Andrea Rizzi. Informatica per istituti tecnici tecnologici. Vol. A. Per gli Ist. tecnici. Con e-book. Con espansione online - Atlas – 2015
- Agostino Lorenzi, Vittorio Moriggia, Andrea Rizzi. Informatica per istituti tecnici tecnologici. Vol. C. Per gli Ist. tecnici. Con e-book. Con espansione online - Atlas – 2015
- Agostino Lorenzi, Vittorio Moriggia, Andrea Rizzi. Informatica per istituti tecnici tecnologici. Vol. B. Per gli Ist. tecnici. Con e-book. Con espansione online - Atlas – 2015
- Agostino Lorenzi, Vittorio Moriggia. Informatica per sistemi informativi aziendali. Con linguaggio C++. Per gli Ist. tecnici. Con e-book. Con espansione online. - Atlas – 2015
- Agostino Lorenzi, Vittorio Moriggia. C++. Teoria e ambiente di programmazione. Per le Scuole superiori. Con espansione online - Atlas – 2012
- Vittorio Moriggia, Costanza Torricelli. Bank capital in risk management and in investment strategies - Esculapio - 2008
- Vittorio Moriggia, Giuseppe Psaila. Concetti fondamentali di informatica - Esculapio – 2007

## COURSES TAUGHT

### 2020/2021

- **MATLAB for Decision Maker** (6 credits, 36 of 48 hours)
  - ✓ Language of the course: English
  - ✓ Educational goals:
    - The use of MATLAB environment and language to support decision maker.
  - ✓ Degree course:
    - Master's Degree in Business Administration, Professional and Managerial Accounting.
  - ✓ Faculty:
    - Department of Management, Economics and Quantitative Methods at University of Bergamo.
  - ✓ Course contents:
    - Introduction to MATLAB

- Matrices, expressions, functions
- Graphics
- Help on-line, system windows
- Matrix manipulation, linear algebra
- Other data structures
- .M files and programming language
- Structure of control
- Script and function
- Object Handles
- Toolboxes of MATLAB
- Statistical Toolbox
- Optimization Toolbox
- Financial Toolbox
- Business Information Management

✓ Textbooks:

- Lecture notes
- MATLAB official documentation
- C. Pocci, G. Rotundo, R. De Kok, "MATLAB", Maggioli Editore, ISBN 8891623027.

• **Computer Science** (6 credits, 48 hours)

✓ Language of the course: Italian

✓ Educational goals:

Some of the objectives relate to advanced ECDL. Aim is to acquire basic concepts and the practical ability to use the relevant software.

✓ Degree course:

Bachelor's degree.

✓ Faculty:

Department of Management, Economics and Quantitative Methods at University of Bergamo.

✓ Course contents:

Basic concepts of logic

Basic concepts of information theory

Practical knowledge of electronic spreadsheet functions (particularly Excel) and its use in the area of Calculation and corporate management

Fundamental theoretical concepts of Data Bases, especially relational Data Bases

SQL query language

Practical knowledge of the functions of DBMSs (especially Access) and its use in the area of corporate management

✓ Textbooks:

Teacher's slides

A.Lorenzi, E.Cavalli, PRO.SIA 4 - Informatica e processi aziendali, Atlas, 2018

A. Lorenzi, E. Cavalli, Progettazione dei database - Linguaggio SQL dati in rete: Access, MySQL, Pagine ASP, Pagine PHP - Atlas 2011.

• **Management Information System** (6 credits of 6, 48 hours)

✓ Language of the course: Italian

✓ Educational goals:

To approach the main themes of Information Management and dataflow in a company.

✓ Degree course:

Bachelor's degree program in Statistics and Computing for Company Management.

✓ Faculty:

Department of Management, Economics and Quantitative Methods at University of Bergamo.

✓ Course contents:

Introduction to Visual Basic for Excel

Arrays and I/O of VBA

Introduction di HTML and CSS

Javascript programming

Introduction to MySQL

Php language

Asp with Access

✓ Textbooks:

Teacher's slides

A. Lorenzi, E. Cavalli; Le basi di dati e il linguaggio SQL. Teoria; Edizioni Atlas.

A. Lorenzi, E. Cavalli; MySQL e database in rete; Edizioni Atlas.

- **Coding for Data Science** (38 hours), part of course Coding and Machine Learning.
  - ✓ Language of the course: English
  - ✓ Educational goals:
    - Computer programming for beginners based on Python.
  - ✓ Degree course:
    - Master's Degree in Economics and Data Analysis.
  - ✓ Faculty:
    - Department of Management, Economics and Quantitative Methods at University of Bergamo.
  - ✓ Course contents (draft):
    - Computer architecture, Operating System, file system
    - Software. Numbering systems
    - Boolean algebra. Logical operators
    - Internal data type
    - Python programming language, Keyboard input
    - Constants, Variables, predefined types
    - Conditions and loop for
    - Loop while. Strings
    - Lists
    - List scanning. List duplicate
    - Dictionary
    - User function
    - Anonymous function
    - Introduction to database
    - Files
    - OOP
    - User class
    - Graphics
  - ✓ Textbooks:
    - Lambert K.A., "Fundamentals of Python: First Programs", Course Technology, 2012.
    - Lorenzi A., Cavalli, E., Moriggia V., "Linguaggio Python", 2019, Istituto Italiano Edizioni ATLAS, ISBN: 8826821909.
  
- **Computer Science (programming)** (6 credits, 32 of 48 hours)
  - (\*) Tutoring covered by Dr. M. Rosa.
  - ✓ Language of the course: Italian
  - ✓ Educational goals:
    - Introduction to computer science and programming language, based on Python.
  - ✓ Degree course:
    - Bachelor's degree program in Technology Engineering for Health, School of Engineering.
  - ✓ Faculty:
    - Department of Engineering and Applied Sciences at University of Bergamo.
  - ✓ Course contents (draft):
    - Computer architecture, Operating System, file system
    - Software. Numbering systems
    - Boolean algebra. Logical operators
    - Internal data type
    - Python programming language, Keyboard input
    - Constants, Variables, predefined types
    - Conditions and loop for
    - Loop while. Strings
    - Lists
    - List scanning. List duplicates
    - Dictionary
    - User functions
    - Anonymous functions
    - Introduction to database
    - Files
    - OOP
    - Graphics
  - ✓ Textbooks:

Lorenzi A., Cavalli, E., Moriggia V., "Linguaggio Python", 2019, Istituto Italiano Edizioni ATLAS, ISBN: 8826821909.

Moriggia V., Psaila G., "Concetti Fondamentali di Informatica", 2007, EsculaEsculapio, Progetto Leonardo.

### **2019/2020**

- **MATLAB for Decision Maker** (6 credits, 36 of 48 hours)
- **Computer Science** (6 credits, 48 hours)
- **Management Information System** (6 credits of 6, 48 hours)
- **Python course** (complementary lectures, 20 hours)
- **Computer Science (programming)** (6 credits, 32 of 48 hours)

### **2018/2019**

- **MATLAB for Finance** (6 credits, 36 of 48 hours)
- **Computer Science** (6 credits, 48 hours)
- **Management Information System** (6 credits of 6, 48 hours)
- **Computer Science (programming)** (6 credits, 32 of 48 hours)

### **2017/2018**

- **MATLAB for Finance** (6 credits, 36 of 48 hours)
- **Computer Science** (6 credits, 48 hours)
- **Information Technology for Finance** (6 credits of 6, 48 hours)
- **Computer Science (programming)** (6 credits, 32 of 48 hours)

### **2016/2017**

- **MATLAB for Finance** (6 credits, 36 of 48 hours)
- **Computer Science** (6 credits, 48 hours)
- **Information Technology for Finance** (6 credits of 6, 48 hours)
- **Computer Science** (6 credits, 32 of 48 hours)

### **2015/2016**

- **MATLAB for Finance**
- **Computer Science** (6 credits, 48 hours)
- **Information Technology for Finance** (3 credits of 6, 24 of 48 hours)
- **Computer Science** (6 credits, 32 of 48 hours)

### **2014/2015**

- **MATLAB for Finance**
- **Computer Science** (6 credits, 48 hours)
- **Information Technology for Finance** (3 credits of 6, 24 of 48 hours)

### **2013/2014**

- **MATLAB for Finance**
- **Computer Science** (6 credits, 48 hours)
- **Information Technology for Finance** (3 credits of 6, 24 of 48 hours)

### **2012/2013**

- **MATLAB for Finance**
- **Computer Science** (6 credits, 48 hours)
- **Information Technology for Finance** (3 credits of 6, 24 of 48 hours)

### **2011/2012**

- **MATLAB for Finance**
- **Computer Science** (6 credits, 48 hours)
- **Information Technology for Finance** (5 credits, 40 hours)

### **2010/2011**

- **Information Technology for Finance - Advanced**
- **Computer Science** (6 credits, 48 hours)
- **Algorithms and Programming Techniques** (3 of 9 credits, 24 hours), the first 6 credits come from Computer Science of Faculty of Engineering

### **2009/2010**

- **Information Technology for Finance** (9 credits, 72 hours)
- **Financial Engineering I** (3 credits, 24 hours)
- **Algorithms and Programming Techniques** (3 of 9 credits, 24 hours), the first 6 credits come from Computer Science of Faculty of Engineering
  
- **Introduction to GAMS**
- **Algorithm and Programming**

### **2008/2009**

- **Information Technology for Finance** (9 credits, 72 hours)
- **Financial Engineering I** (3 credits, 24 hours)
- **Information Technology for Finance - Advanced**
- **Computer Science** (5 credits, 32 hours, annual contract)

### **2007/2008**

- **Information Technology for Finance** (9 credits, 72 hours)
- **Financial Engineering I** (3 credits, 24 hours)
- **Information Technology for Finance - Advanced** (8 credits, 64 hours)
- **Computer Science** (5 credits, 32 hours, annual contract) for Management Engineering and Textile Engineering.
- **SILSIS - Post-graduate School for Teachers**, section of Bergamo and Brescia
  - Data treatment for Economics and Financial decisions.
- **Excel (advanced)** for Azienda Sanitaria Locale (ASL) of Bergamo.

### **2006/2007**

- **Information Technology for Finance** (6 of 9 credits, 48 hours)
- **Financial Engineering I** (3 credits, 24 hours)
- **Computer Science** (5 credits, 32 hours, annual contract) for Management Engineering and Textile Engineering.
- **Excel (basic)** for Azienda Sanitaria Locale (ASL) of Bergamo.
- **Networks and Network Issues** (6 of 9 credits, 48 hours)
- **SILSIS - Post-graduate School for Teachers**, section of Bergamo and Brescia
  - Data treatment for Economics and Financial decisions.
- **C++ and Object Oriented Programming (OOP)**
- **Numerical Methods** (3 credits)
- **VBA in Excel**

### **1998 - 2006**

Similar courses.

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