IDEA League opportunities
By Stefano Ronchi (Rector’s Delegate for International Relations in Western Europe)

INTRODUCTION
Universities have been facing the globalization challenge for many years, with a particular acceleration in the last decade. Beyond the increasing number of students participating in international experiences during their study career, more and more are applying to universities abroad for their entire postgraduate studies - i.e. Masters or PhDs (1). Moreover, part of the global R&D spending is moving from US and Europe to Asia (2).

In this context universities would need huge amounts of resources to be competitive at the international level and to provide high quality research and education, thus envisaging possible risks in the long run for those institutions not able to sustain such huge investments. One viable option is then networking and collaboration: by creating strong and selected strategic partnerships, universities will be able to find synergies and economies of scale enabling the launch of both education and research initiatives to be attractive and to compete at the global level. In France, for example, the government has started in the last years a process of higher education and research consolidation around few clusters grouping together both universities and research institutions across the whole country.

There are different examples of university partnership networks around the world, and in particular in Europe, going beyond the boundaries of a single country (e.g. T.I.M.E., UNITECH, EuroTech, Nordic Five Tech, ...). Some of them are limited to some specific activities, others are more comprehensive in nature and involve a wide set of initiatives. Among the latter ones, IDEA League is the first created by a pool of top quality European universities of Science and Technology, being founded in 1999. In March 2016 Politecnico di Milano joined the network, which is now formed by five members (table 1).

<table>
<thead>
<tr>
<th>University</th>
<th>Students</th>
<th>QS Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>ETH Zurich</td>
<td>19,000</td>
<td>2nd</td>
</tr>
<tr>
<td>TU Delft</td>
<td>20,000</td>
<td>6th</td>
</tr>
<tr>
<td>Politecnico di Milano</td>
<td>40,000</td>
<td>7th</td>
</tr>
<tr>
<td>RWTH Aachen</td>
<td>43,000</td>
<td>14th</td>
</tr>
<tr>
<td>Chalmers</td>
<td>11,000</td>
<td>23rd</td>
</tr>
</tbody>
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Table 1. IDEA League members and their QS Top University Ranking 2015 among the European Universities of Engineering & Technology.

The main ambition of IDEA League is to re-establish Europe as a technological and scientific leader by bundling academic resources and knowledge. Its joint activities in education, research and quality assurance, as well as the joint participation in EU programmes and initiatives make it a model of European cooperation. The network creates added value by pooling resources for collaborative and complementary programmes for students, researchers and staff. Within the wide set of opportunities, our PhD community could benefit from at least three key activities promoted by IDEA League: Annual Doctoral School, Summer Schools and Research Grants.

ANNUAL DOCTORAL SCHOOL
The Annual Doctoral School of IDEA League offers programmes jointly designed and conducted by the partner universities, based on the complementary expertise provided by each partner and the ensuing synergies. The Doctoral School Programmes combine the search for solutions for global challenges with innovative doctoral training. They offer a unique opportunity for outstanding PhD students to enrich their research. Generally, the duration of the Doctoral School ranges from one to three weeks. All costs are covered and PhD students have to face only travel expenses.
SUMMER SCHOOLS
IDEA League offers excellent MSc and PhD students of the network the unique opportunity to develop new insights into current research, and to enhance their skills and academic excellence by participating in the Summer Schools. Together with their peers from the partner universities, students are encouraged to form a network beyond the programme, possibly doing a future research exchange. Generally, each university organizes a summer school from two to seven days long on a proposed topic. All costs are covered and students have to face only travel expenses.

RESEARCH GRANTS
Every year, PhD students might apply for a research grant (1.000 €/month) supporting a research period in one of the partner universities. The content of the research activity has to be approved by the thesis supervisor and the hosting professor, and the duration of the stay is between 2 weeks and 6 months. In conclusion, being part of IDEA League is a great opportunity for our institution to foster joint research activities, exchanges and collaborations with top technical universities in Europe, and our PhD candidates will play a crucial role in this ambitious venture.

Calls and events
18th EDIM WORKSHOP – Industry 4.0 The Digital Transformation
This year the annual EDIM workshop (European Doctorate in Industrial Management) will be held in Cremona in partnership with the project Smart Manufacturing 2020, KTH Royal Institute of Technology (KTH), Sweden, Universidad Politécnica de Madrid, Spain and Politecnico di Milano. Researchers from 20 different countries will meet representatives from the industry such as Dallara, ENEL, Whirlpool, e Carpigiani.
8-10 June 2016

Roberto Rocca doctoral Fellowships
Presentation open to all PhD candidates and researchers interested in a possible stay at MIT, by prof. Luca Daniel, MIT
Tuesday, June 21st 2016 - 4.30PM, Room D03, Campus Leonardo Via Golgi 40

Training Course "Better Business Writing"
By prof. Peter Frederick, author of the book "Persuasive Writing: How to Harness the Power of Words" (2011). Registration (here) is free but mandatory for logistic reasons. Only a limited number of applications will be accepted (chosen on a first-come first-registered basis, with preference given at applicants enrolled regularly in the third PhD year).
Tuesday, June 28th 2016 - 9.30AM to 4.30PM, Aula Lombardi, Building 6, Leonardo Campus

HackZurich
What am I supposed to do there? You will team up to create a web, mobile, or desktop application during a 40 hours non-stop hacking marathon. Registration opens on Friday, June 10, 2016
Zurich Technopark, Switzerland. From Friday, September 16th to Sunday, September 18th, 2016
Seminars

Technically speaking! & Technically writing!
Technically Speaking! - How to give a good technical presentation & Technically Writing! - How to write a good technical paper. By prof. Bertrand Meyer.
June 8th, 2016 - h.09.30-13.30 - Bd 24, Ground Floor, Room Alfa - Campus Leonardo

Social design and aesthetics
A lecture reflecting on the aesthetics of services. By Prof. Ilpo Koskinen.
June 30th, 2016 – h. 12.00-14.00 - c/o Polifactory - Via Candiani, 72 - Campus Bovisa

Cannabis Legalization: Lessons from Early Experience in the United States
Jonathan P. Caulkins and H. Guyford Stever, professors of Operations Research and Public Policy, Carnegie Mellon University (PA-USA) will talk with us about the early US experience with cannabis legislation. For the first time US jurisdictions are legalizing cannabis production and sale for non-medical use and the talk will dispel some of the myths and inform on pros and cons.
Monday, September 26th 2016 – h.13.00 – Bd 3, Aula De Donato - Campus Leonardo

Data Fusion for In-Process Quality Improvement: Concepts, Achievements and Opportunities
Jianjun (Jan) Shi, Georgia Institute of Technology
The seminar will discuss the concepts, achievements, and opportunities of data fusion for In-Process Quality Improvement (IPQI) in complex manufacturing systems.
June 17th, 2016, h. 14.00 Sala Consiglio - Department of Mechanical Engineering

Issues of Governance in the Global South
Investigating rural/urban, formal/informal interconnections: lessons for the north
Arman Fadaei and Liliana Giraldo
This seminar will explore the issues of governance in fast urbanizing context of the global south. It scrutinizes the complex relationship between the notions and conditions that are often perceived in binary relations; rural and urban, formal and informal, planned and spontaneous.
June 6th, 2016 – h.10.00-16.00

The Mental Maps of Italian Enterpreneurs: the Territorial Attractiveness of Italy
Dario Musolino (Università Bocconi) - Ilaria Mariotti
The objective of the seminar is to discuss and explain the mental maps of entrepreneurs in Italy, their characteristics and their explanatory factors, making basis on the findings coming from a research recently carried out by the author in Italy.
June 14th. 2016 – h. 11.00 - 12.30 Master Room DASTU of Nave Open Space

The Political meaning of Informal Urbanism
Roberto Rocco (TU Delft) and Giuseppina Forte (Berkely University)
June 24th

Compacted soils: hydro-chemo-mechanical issues
Gabriele Della Vecchia
June 9th, 2016

Modeling of damage and failure of fiber reinforced polymer composites
Anna Pandolfi - Marisol Koslowski
June 20th, 2016
Starting courses – PhD School

INTRODUCTION TO SIMULATION AND MODELING OF COMPLEX DYNAMICAL SYSTEMS
Professor Luca Daniel, MIT
In this course we will survey several techniques to generate and simulate dynamical models of large multiphysics engineering systems. Techniques for uncertainty quantification and model order reduction, for enabling fast design exploration, robust optimization, and inverse problems solution. Detailed examples will be presented, from a variety of engineering disciplines (see more here):
- **Electrical Engineering** (interconnect networks including parasitics; fullwave electromagnetic structures; analog and digital circuits, nonlinear semiconductor devices, MEM Devices ...);
- **Mechanical Engineering** (frame models, heat diffusion, fluid-dynamics, blood/water/oil transport);
- **Civil Engineering** (structural problems, vibrations);
- **Material Sciences** (inverse problems for identification of material properties);
- **Biomedical Engineering** (biochemical reactions, magnetic resonance, cardio-vascular systems)

The course will start on Tuesday, 21st June 2016, Room D03, Campus Leonardo Via Golgi 40

UNMANNED AUTONOMOUS VEHICLES IN AIR, LAND AND SEA
Professor Luca Bascetta
The course presents the knowledge required to better understand commonalities specificities of unmanned autonomous vehicles design in the different domains of air, land, and sea, introducing:
- the most common vehicle kinematic and dynamic models;
- the fundamentals on path/trajectory and mission planning;
- the fundamentals on vehicle model identification and state estimation;
- the most common sensors for vehicle localization, control, obstacle avoidance;
- the fundamentals of predictive control for trajectory tracking, stabilization, obstacle avoidance

Complete application case studies for air, marine and land domain will follow, to highlight required adaptation to cope with their peculiarity: fixed wing and rotary unmanned aerial vehicles, off-road unmanned vehicles; surface and underwater unmanned vehicles. SoA, current trends and future applications will be presented and discussed in a final panel, with people from academia and industry.

The course will start on Monday 6th June 2016

SCIENCE, TECHNOLOGY, SOCIETY AND WIKIPEDIA
Professor Guido Raos
The course aims to provide some hand-on training in technical writing and, at the same time, to contribute to the general diffusion of scientific and technical knowledge. These will be achieved by engaging Politecnico’s PhD students in the production of new material (or revision of existing one) for Wikipedia.

The course will start on Thursday 16th June 2016

Starting courses – Doctoral Programmes

PhD in Architectural, Urban and Interior Design

THEORETICAL FUNDAMENTALS OF ARCHITECTURAL, URBAN AND INTERIOR DESIGN
Prof. Raffaele Pugliese
The Colloqui di Architettura are dedicated to the exploration of the disciplinary foundations of architecture, urban and interior design.

The course will be from Tuesday, 17th May 2016 to Tuesday, 25th October 2016
PhD in Design

RESEARCH IN DESIGN. ACADEMIC CASES HISTORY

Prof. Raffaella Trocchianesi

The course aims to explore topics and approaches of the research in design through several presentations of experiences in academic research as case history. Every lecture will be focused on a specific case of theoretical or applied research in the national or international field. The thematic framework will be analysed and, in the same time, the structure of the research, the methodology and the process from the proposal to the development and dissemination phases.

The course will start on June 14th 2016

PhD in Environmental and Infrastructure Engineering

GROUNDWATER

Prof. Alberto Guadagnini

The course strongly emphasizes key elements of classical and modern stochastic analysis of groundwater flow and contaminant transport in heterogeneous aquifers and reservoirs.

The course will start on June 8th 2016

PhD in Information Technology

PARADIGMATIC MODELS IN SOCIAL SCIENCES

Prof. Fabio Dercole

The aim is to show how the scientific approach based on dynamical system and networks theories can be used to tackle social problems. A series of paradigmatic examples will be presented.

The course will start on September 26th 2016

INTEGRATION AND COMPUTATIONAL ANALYSIS OF GENOMIC AND PROTEOMIC INFORMATION

Prof. Marco Masseroli

For those who wish to broaden the culture on the application to biological data of computer engineering principles and methods about information theory and knowledge extraction.

The course will start on June 21st 2016

PhD in Mechanical Engineering

FINITE ELEMENT IN ENGINEERING DESIGN

Prof. Shaker A. Meguid

Upon completion of the course, the students will be able to: develop comprehensive understanding of the fundamentals of the finite element method; Develop the skills needed to build FEM models of physical problems and apply appropriate boundary conditions and the applied loads; Implement the method in a finite element program; Develop the appropriate knowledge of how commercial codes function; Develop critical thinking in interpreting results from FEM analysis; Avoid FE pitfalls, ensure accuracy and convergence.

The course will start on June 7th 2016
PhD in Structural Seismic and Geotechnical Engineering

ADVANCED STRUCTURAL DYNAMICS

Prof. Federico Perotti, Prof. Luca Martinelli, Prof. Vitomir Racic

The course will start on June 16th 2016

The detailed Programme of each course is available from the Programmes’ Courses page, or here: 📖. For more information, i.e. about starting date and classrooms, please check the “notes” field in the Course Details (follow the icon 📝) or send an email message to the responsible for the Course: 💌. Candidates from PoliMi PhD School must include the Course in their study plan. Others must contact the responsible for the course.

To submit information about seminar, events, and other news for publication in forthcoming newsletters, please download and fill in the following format, and E-mail it to: phd-newsletter@polimi.it