Department at a Glance

People:
• 62 professors
• 62 PhD students
• 92 res. assistants
• 8 admin. staff

9 research areas
8 degrees
8 spin-offs
11 patents

Total:
• > 200 people working in the Department

11 April 2017
62 people by the end of 2018:
- 16 Full professors: 18
- 21 Associate professors: 25
- 25 Assistant professors: 25

Internal / external recruitment
- All professors worked abroad for a long period
- 9 professors received a degree in Verona
- 53 professors came from other universities
  - 8 professors came from abroad
Mission

- Technology transfer:
  - Computer Science Park
  - patents
- CS Museum

9 research areas:
- products
- projects

8 degrees:
- 3 master degrees
- 3 PhD courses
Research Areas

- Discrete and computational mathematics
- Mathematics - applications and modeling
- Theory of computation
- Software Engineering and Security
- Information systems
- Bioinformatics and Medical Informatics
- Machine intelligence
- Cyber-physical systems
- Experimental applied physics
- Mathematics
- Computer science
- Computer engineering
- Physics
With respect to the FP7 time period (2007-2013)

- General research:
  - 2000 international publications
  - 26 national and international projects
    - 7.7 M€ funding

- Finalized research:
  - 5 spin-off companies
  - 10 patents
  - 253 grants with companies
    - 4.8 M€ funding

Results on Horizon 2020 (2014-2016)

- 56 projects submitted
- 15 positively evaluated
- 5 funded
  - 2.3 M€ funding
Computer engineering
- 5° position among 49 institutions
  - 1° position in the recruitment policies
- average score 0.81 / 1
- + 22% on the national result

Mathematics and Computer Science
- 9° position among 59 institutions
- average score 0.69 / 1
- + 15% on the national result

Physics
- 26° position among 55 institutions
- average score 0.80 / 1
- + 3% on the national result
Bachelor degrees:
- Computer science 738 +33%
- Bioinformatics 453 +44%
- Applied mathematics 203 +21%

Master degrees:
- Computer sci. & eng. 133 +0%
- Medical Bioinformatics 31 +100%
- Mathematics 75 +12%

Post master:
- Computer game development 9
- Ph.D. in Computer science (11)
- Mathematics (3)
- Nano-sciences (2)
Mathematics: Driving Innovation to Industry

Socio-economical impact of Mathematical Sciences:
16% PIL, 10% occupation, constantly increasing trend. **Key factor** and **essential added-value** for growth and **competitiveness of leading sectors** of economical development.
(Deloitte-CMI reports: UK 2012 - NL 2014 - France 2015)

Need to strengthen links Higher Education vs Industry
Educational paths (MSc, PhD) providing strong modelling and computational contents
Initiatives supporting better math expertise at SME level

Main Impact Sectors
- Biomedical - Pharmaceutical
- Finance - Banking
- Security - Data Revolution
- Energy - Green Economy
- Aerospatiale - Automotive
- Advanced Manufacturing
- Materials Science
- Research & Development

Mathematical skills needed
- modelling - simulation - optimisation
- high performance computing
- statistical data, signal and image analysis
- cryptography - computer system security
Master Degree in Mathematics

- Educational Center European Consortium for Mathematics in Industry [https://ecmiindmath.org]

- Percorso modellistico-computazionale: solida preparazione matematica di base ed avanzata con insegnamenti opzionali specifici:


- Seminari di professionisti aziendali: traders, practitioners, quantitative analysts, business consultants, software developers di Intesa Sanpaolo, Banco Popolare, Generali, PWC, ITAS, BCC, Accenture, Fairmat, PensPlan, Enginsoft...

- Mobilità internazionale Erasmus+: formazione, traineeship, stage e tesi in laboratori R&D presso sedi partner prestigiose (Parigi, Barcellona, Oslo, Monaco, Nizza, Innsbruck, Grenoble, Sofia, Novi Sad,...)

- Stage e tirocini: ricca offerta di sviluppo di tesi e progetti di collaborazione presso aziende partner sul territorio

- Study groups with Industry, modelling weeks: modellizzazione e risoluzione di problemi concreti posti da aziende e da enti pubblici. Web page PhDMW2016: [http://profs.scienze.univr.it/caliari/phdmw/]
A Patchwork of Competences

Dept. of Computer Science

Dept. of Biotechnologies

Medical Bioinformatics

School of Medicine and Surgery

Dept. of Medicine - Dept. of Neurosciences, Biomedicine and Movement Sciences - Dept. of Diagnostics and Public Health -
In recent years, the concept of genome structure has emerged as a key component of biological research. The study of genome structure and its evolution has provided insights into the diversity and complexity of biological systems. This review focuses on the informational laws of genome structures, which are fundamental to understanding the design and function of genetic information.

The informational laws of genome structures are rooted in the principles of information theory and complexity science. They are based on the idea that genetic information is encoded in a way that is both efficient and robust, allowing for the evolution of complex organisms. These laws provide a framework for analyzing the structure and function of genomes, and for predicting the behavior of genetic systems.

The study of genome structure is essential for understanding the evolution of life. By analyzing the informational laws of genome structures, researchers can gain insights into the mechanisms that have shaped the diversity of life, and into the processes that govern the evolution of complex biological systems.

In conclusion, the informational laws of genome structures are a fundamental aspect of life science. They provide a powerful tool for understanding the design and function of genetic information, and for predicting the behavior of genetic systems. The study of these laws is an important area of research that will continue to provide insights into the complex and fascinating world of life.
Laurea Magistrale in Ingegneria e scienze informatiche

Corsi Qualifying

Curricula
- Sicurezza dei sistemi informatici
- Sistemi Embedded
- Visual computing

Dottore magistrale in Ingegneria e scienze informatiche

Esame di Stato + Iscrizione all’albo degli Ingegneri Informatici
Cosa proteggiamo

Generale: Politiche e meccanismi di sicurezza
Software: Vulnerabilità del Software (es. Buffer overflow)
Reti: Protocolli, comunicazioni, dati in transito,…
Sistemi Informativi: Dati sensibili, privacy, anonimità e affidabilità

Come proteggiamo

Analisi statiche
Analisi Dinamiche
Verifica
Crittografia

11 April 2017
Sistemi embedded pervasivi (ciberfisici):
• integrazione di sistemi eterogenei
• progettati con competenze specifiche ma:
  • necessità di visione generale
  • necessità di conoscere relazioni tra le competenze
• integrazione di competenze (3C):
  • calcolo (*computation*)
  • controllo (*control*)
  • comunicazione (*communication*)

Necessità di formazione:
• specialistica, ma interdisciplinare (magistrale)
• integrazione di tre aree dell’ingegneria attualmente separate
sviluppare sistemi di visual computing

riconoscere
percepire
ragionare
agire

Sistemi di automazione industriale

Sistemi di autenticazione (tramite voce, volto, iride,...)

Sistemi di raccomandazione

11 April 2017
Il master ha l’obiettivo di formare sviluppatori di videogiochi e/o applicazioni multimediali avanzate.
Spin-offs:
- 2 established
- 1 just spin-in
- 1 on-going

Start-ups:
- 3 on the market by more than 7 years

R&D
- 1 of a large company

People:
- 19 operating partners
- 6 permanent employees
- 6 temporary employees

1.1M€ annual turnover
- 200K€ to DI per year

Total:
- 31 people involved + n consultants
Promote the technology transfer in all information and communication technology (ICT) fields

The Computer Science Park (CSP):
• supports the creation of spin-offs
• attracts start-ups
• effective location for technical offices

Funded projects organization:
• consortium organization
  • partners for RTI, international links
• proposal preparation
• coordination and third-party structure
  • in Horizon 2020 - POR - JP
VR-CSM started in 2008, promoted by:
  • Vincenzo Manca - AICA Referent
  • Roberto Giacobazzi - Dean of the Faculty of Science
  • Carlo Combi - Dean of the Department of C.S.

It is a follow up of two courses on Computer Science History (2007, 2008):
  • funded by AICA (Associazione Italiana per il Calcolo Automatico)
  • within a National Project of C.S. History in the Italian Universities (11 selected Universities)

More than 1000 objects have been archived:
  • mechanical calculators, computers, software, manuals, books

150 pieces are freely available organized in:
  • 33 display boxes on three floors of Cà Vignal 2
  • a didactic laboratory
Il Sole 24 Ore: 2 May 2013

Una struttura di ricerca con molte "anime"

Il futuro si crea oggi, grazie a tante "anime" che danzano, alla collaborazione, alla creazione. L'Il Sole 24 Ore di Verona nasce oggi all'interno del "Computer Science Park", quello che è il primo "incubatore" di informazione digitale al mondo, un polo che racchiude le nuove sfide in campo informatico, un polo che è il punto di partenza per una nuova epoca, un polo che è illu...