

Personal

- **Name:**
Alessio Vincenzo
- **Surname:**
Cardillo
- **Year of Birth:**
1982
- **Place of Birth:**
Catania, Italy
- **Gender:**
Male
- **Marital Status:**
Single, No Children
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- **Research group homepage:**
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Education

Present:

Student of the second level (master degree) undergraduate course of Nuclear and Subnuclear Physics at Catania University.

October 2006:

First level (bachelor) degree in Physics, University of Catania obtained with 110/110.
Thesis: "Topological Analysis of Scientific Coauthorship Networks",
Supervisor: Prof. Vito Latora.

July 2001:

Diploma of Aeronautical Surveyor, Aeronautical Technical Institute "A. Ferrarin" of Catania obtained with 100/100 with praise.

Extra Courses

June 2000

Preliminary English Test (P.E.T.) of Cambridge University awarded with **pass**;

Summer 2000

Training Course "**Prometeo**" of the Aeronautical Technical Institute "A. Ferrarin" of Catania;

Summer 2000

English course of the Kent School of English (K.S.E.) during "Prometeo" course;

January 2001

English course of the Kent School of English (K.S.E.) in Broadstairs (UK);

December 2001

Course "*Introduction to Astronomy*" of the Catania's Astrofilii Group;

March 2004

Base level course on Linux OS of the **INFN** (*CLiC*);

March – April 2007

Introduction course on Grid computing of the European Project **ICEAGE** in collaboration with University of Catania and INFN;

29 September - 06 October 2008

Course on High Performace Parallel Computing organized by INAF, INFN, University of Catania, Cometa Consortium and CINECA;

13 - 14 November 2008

Course Tools and Techniques for Scientific Computation under Linux/Unix organized by CINECA;

Computer Skills

Operative Systems:

GNU/Linux (Ubuntu, Fedora, SuSE, Mandrake, Slackware, Knoppix Live, Knoppix);
Windows (98, ME, 2000, XP);
MS-Dos;

Programming Languages:

C (good knowledge);
Fortran 77;
MPI;
OpenMP (basic notions);
Python;
C++ and Java (few notions);
HTML (4.01);
Cascading Style Sheets (CSS);
BaSh shell scripting;
JavaScript;

Others:

L^AT_EX(good knowledge);
LSF & OpenPBS job manager ;
GDB, Gprof, Valgrind;
GIMP; Gnuplot; Xm-Grace; Pajek;

Language Skills

Mother Tongue:

Italian ;

Other Languages:

English (good knowledge);
Spanish (average knowledge);

Jobs

June – July 2008:

HPC-Europa++ Fellowship Transnational Access Programme, project (RII3-CT-2003-506079)
Department Fisica Fonamental, Facultat de Fisica, Universitat de Barcelona – Barcelona,
Spain and Barcellona Supercomputing Center (BSC) – Barcelona (Spain).

February 2007:

Form filling of the Physics Ph.D. database Catania's University.

February 2006:

Teacher in "*Spatial Analysis course on geographical network*" of the Irecoop Lombarda of Milan.

October - December 2004:

Teacher in "*Base level course on Linux*" of the ARCES association of Catania.

Experiences

June – July 2008

Visiting Scientist – Department of Fundamental Physics, Faculty of Physics, University of Barcelona – Barcelona Spain ;

2008

Selected for the University of Catania seven rugby team at the National University Championship - Pisa ;

2007

Selected for the University of Catania seven rugby team at the National University Championship - Jesolo (VE) ;

2004

Short Listed team (*Etna Valley Research Team*) of the **ESA** "*Student Parabolic Flight Campaign*";

2003

Short Listed team (*Etna Valley Research Team*) of the **ESA** "*Student Parabolic Flight Campaign*";

Interests

Presentation (My Scientific Background)

I am an undergraduate student in Physics, second level degree (master degree), at the University of Catania. My main interests are in theoretical physics and in particular in statistical mechanics.

Since 2005 I have been involved in the Complexity and Non-linear dynamics research under the supervision of Prof. Vito Latora. I am member of the Applied Theoretical Physics group (ATP) at the Department of Physics (<http://www.ct.infn.it/atp>). I am also member of the Humanspacelab group of Polytechnic of Milan (<http://www.humanspacelab.com/>). In these years the main topics I have focused on dealt with complex networks structural properties like average path length, clustering coefficient, etc. In particular I have studied these properties in urban city networks and scientific coauthorship networks (SCN). I have also worked on the correlation between network topological features (like betweenness centrality) and commercial retail indices.

Recent Achievements (What I'm doing now)

During the last year, in collaboration with also Dr. Jesus Gómez-Gardeñes I have focused more on dynamical processes acting on a network. In particular I have studied the problem of finding an immunization strategy which doesn't need a complete knowledge of the system while minimizing the resources needed to do it. The efforts lead me to the formulation of a new immunization strategy based on d-Covering method created by Echenique et. al. which has been named Propagation d-Covering. The results found lead us to attack the problem of Weighted Networks immunization and comparison between the "simple" d-Covering and the Propagation d-Covering. I have also worked on evolutionary game theory on complex networks and in particular I have focused on studying the role of the topology on the stationary state of the system. Recently I am dealing with network based on biological systems (like leafs) and on a comparison between them and man made networks like cities.

Publications

- A. Cardillo, J. Gómez-Gardeñes, D. Vilone, A. Sanchez
Coevolution of strategies and update rules in the Prisoners Dilemma game on complex networks
Submitted for publication. July 2010, Preprint arXiv: physics.soc-ph/1007.3626
- A. Cardillo
Propagation d-Covering on Weighted Complex Networks
HPC-Europa++, Science and Supercomputing in Europe annual report (2008). September 2009.
- Porta S, Latora V, Wang F, Rueda S, Cormenzana B, Crdenas F, Latora L, Strano E, Belli E, Cardillo A, Scellato S
The Geography of Street Centrality and its Correlation with Economic Activities: the Case of Barcelona (ES)
Submitted for publication.
- S. Porta, E. Strano, V. Iacoviello, R. Messori, V. Latora, A. Cardillo, Fahui Wang, S. Scellato
Street centrality vs. commerce and service locations in cities: a Kernel Density Correlation case study in Bologna, Italy
Urban & Planning B **36** (2009), 450-465 preprint arXiv: physics/0701111 .

- Alessio Cardillo, Salvatore Scellato, Vito Latora
Topological Analysis of Scientific Coauthorship Networks
Physica A **372** (2006) 333.
- Alessio Cardillo, Salvatore Scellato, Vito Latora, Sergio Porta
Structural Properties of Planar Graphs of Urban Street Patterns
Phys. Rev. E **73** (2006) 066107 preprint at arXiv:physics/0510162 .
- Salvatore Scellato, Alessio Cardillo, Vito Latora, Sergio Porta
The Backbone of a City
Eur. Phys. J. B **50** (2006) preprint at arXiv:physics/0511063 .

Talks & Other

- Alessio Cardillo, Salvatore Scellato, Vito Latora, Sergio Porta
Structural properties of urban street patterns, discovering the backbone of a city.
Poster presented at the conference: “Transportation networks in nature and technology”, Paris (France), June 2010;
- **Structural properties of urban street patterns and the Multiple Centrality Assessment**
Talk gave at the workshop “Complex Networks - Equilibrium and Vulnerability Analysis with Applications” , Catania (Italy), March 2008;
- A. Cardillo, J. Gómez-Gardeñes, V. Latora, Y. Moreno
d-covering on weighted complex networks
Poster presented at the conference “Complex Network from Biology to Information Tecnology”, Pula (CA) (Italy), July 2007;

References

- **Prof. Vito Latora**,
Department of Physics University of Catania (Italy), vito.latora@ct.infn.it
- **Dr. Jesus Gómez-Gardeñes** ,
Universidad Rey Juan Carlos (Madrid, Spain), gardenes@gmail.com
- **Prof. Giuseppe G. N. Angilella**,
Department of Physics University of Catania (Italy), giuseppe.angilella@ct.infn.it