



TO MAGNIFICO RETTORE OF UNIVERSITA' DEGLI STUDI DI MILANO

ID CODE _____4409 _____

I the undersigned asks to participate in the public selection, for qualifications and examinations, for the awarding of a type B fellowship at **Dipartimento di _____Filosofia "Piero Martinetti**

Scientist- in - charge: _____ Prof. Pinotti _____

[Name and surname]

CURRICULUM VITAE

PERSONAL INFORMATION

Surname	Poccia
Name	Silvestro Roberto
Date of birth	[4, 2, 1984]

PRESENT OCCUPATION

Appointment	Structure
Research Fellow	University of Turin Department of Computer Science

EDUCATION AND TRAINING

Degree	Course of studies	University	year of achievement of the degree
Degree	Computer Engineering	University of Naplese Federico II	2013
Specialization			
PhD	Computer Science	University of Turin	2019
Master			
Degree of medical specialization			
Degree of European specialization			
Other			

REGISTRATION IN PROFESSIONAL ASSOCIATIONS

Date	of	Association	City
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registration		

FOREIGN LANGUAGES

Languages	level of knowledge
Italian	C2
English	C1

AWARDS, ACKNOWLEDGEMENTS, SCHOLARSHIPS

Year	Description of award
2013-14	<i>Speaker for two college lecture during Multimedia System 2013-2014 class (basics of Blender and Unity) University of Naples Federico II</i>
2014-15	<i>Assistant for the class: "Fundamentals of Computer Science and Databases 2014-2015"</i>
2015-16	<i>Speaker for one lecture on 2015-2016 during the class CSE408 at the Arizona State University</i>
2016-17	<i>Speaker for a lecture on 2016-2017 during the Multimedia Database class at the University of Turin</i>
2018	<i>Speaker for a lecture on May 18 2018 during Multimedia Database class at University of Turin</i>
2018	<i>Speaker for a Seminar, 07/24/2018 at the Gazi University Technology and Innovation Center in Ankara</i>

TRAINING OR RESEARCH ACTIVITY

description of activity

I am doing research in the field pattern discovery in multivariate time series. The goal is to identify repeated patterns that can represent behaviors. The classification of behaviors like this can have an impact, for example in the security field in social networks but on the other side can allow predicting important events in global phenomena like disasters.

Previously during my Ph.D., my research was focused on *leveraging Metadata for Multi-Variate Time-Series Analysis*. During the first year of my Ph.D., I worked on multi-variate time-series in collaboration with Emitlab from Arizona State University (ASU). We created *EpiDMS*, a system to store and manage multi-dimensional time-series data generated within the epidemic domain. In this project, I managed (and developed with) a team of Ph.D. and students at ASU on the technical aspect. I designed and developed a **java J2EE architecture for query and results integration and presentation**. The back end of the project consists of **multiple sources of data stored using databases: SQL, MongoDB, BaseX, OpenTSDB on the back end**. During this project, we faced multiple challenges. Then I start to focus my research over the existing ways for representing and measuring similarities and distances between multi-variate time-series. To compare multi-variate time series especially when there is existing information that allows analyzing the dependency between multiple observation justify my interest in developing new methods to compare time series leveraging this additional information. As a result of this interest, *I propose different extensions to*



standard dynamic time warping (DTW) algorithm, leveraging metadata and groups of variates for classification purposes. Simultaneously, my collaboration with Emitlab continued and we extended the epiDMS framework into a new system, **simDMS (a system which considers multiple types of simulations, not just from the epidemic domain)**. In SimDMS we extend our framework with a query by sample mechanism. To this aim, **we implemented an index based on dominant local events to identify similar series**. The opening challenge: “how can we identify salient events in multivariate time series” motivates my research during the second year of my Ph.D. As a result, I and my coauthors extended the previous work on RMT features by proposing to smooth over time and dependency separately (as opposed smoothing the two dimensions synchronously, as it was in the originally proposed RMT features). The dependency smoothing is computed in a two-step window, with the neighbors defined from a metadata structure. A local dominant aspect in a multi-variate time-series is a particular event able to characterize behavior in a certain period. This raises a question: Can we use this local behavior to capture patterns in the multivariate time series? In other words, are these RMT features suitable for identifying motifs across the multi-variate time series? During my second and third year of Ph.D., I worked on this research problem. My goal is to search for motif instances across variates and time. To achieve this goal, I use local features to identify salient behavior in a multi-variate time-series. Motifs are identified by aggregating salient instances into groups where the instances show similar behaviour. I and my coauthors I have proposed, implemented and evaluated this approach. We are working on a journal paper to disseminate our current findings. In parallel during my third year, I developed some python scripts for collecting geo-localized data that I used for statistical analysis of social behaviors during hurricane events.

During the second year of my Ph.D. I visited Arizona State University, in this period my research activity outside Italy was founded trough the EU-H2020 Marie Skłodowska-Curie grant agreement No 690817 “FourCModeling”

I did my Master’s Thesis Internship, at LABADAM, Università degli Studi di Federico II di Napoli, Supervisor: Prof. Antonio Picariello.

I developed an extensible architecture for domestic exergaming support under the PlatCrHome project, in collaboration with Salvatore Maugeri Foundation, and University of Benevento. **The game was developed using Unity and for the graphical model we used Blender. The code was developed in C#.**

PROJECT ACTIVITY

Year	Project
2014-15	Collective Knowledge University of Naples
2015-16	Epidemic disease project at Arizona State University
2015-19	PhD on multivariate Time series Analysis “project Marie Curie RISE”
2015-19	Research fellow on multivariate motifs detection

PATENTS

Patent

CONGRESSES AND SEMINARS



Date	Title	Place
2016	<i>Speaker at RISE, 4CModeling Workshop Prague</i>	Prague
2017	<i>Speaker for a demo paper at conference EDBT March 21-24, 2017 -</i>	Venice
2017	<i>Speaker at RISE, 4CModeling Workshop London July 3-7, 2017 -</i>	London
2018	<i>Speaker at RISE, 4CModeling Workshop – Turin, Italy on July 16-19</i>	Turin
2018	<i>Speaker for a demo paper, at VLDB August 27-30 – Rio de Janeiro, Brazil.</i>	Rio de Janeiro
2019	<i>Speaker at Conference MEDES 12-14-November- Cyprus</i>	Limassol

PUBLICATIONS

Books
F. Amato, L.Greco, F. Persia, S. R. Poccia <i>"Content-based multimedia retrieval." Data Management in Pervasive Systems.</i> Springer International Publishing, 2015. 291-310. Chapter book
[title, place, publishing house, year ...]
[title, place, publishing house, year ...]

Articles in reviews
Sicong Liu, Silvestro Roberto Poccia, K. Selçuk Candan, Maria-Luisa Sapino, "OLSH: Onion-LSH with Layer-Aware Resource Allocation for Approximate Top-K Query Processing", under review for ICDE, 2020
[title of the article, review, place, publishing house, year ...]
[title of the article, review, place, publishing house, year ...]

Congress proceedings
R. Rossini, S. Poccia, S.K. Candan, M.L. Sapino, CA-Smooth: Content Adaptive Smoothing of Time Series Leveraging Locally Salient Temporal Features proceeding of MEDES 2019 Cyprus
Behrens H. W., Candan K.S., Chen X., Gadkari A., Garg Y., Li M., Li X., Liu S., Martinez N., Mo M., Nester E., Poccia S., Ravindranath M., Sapino M.L. <i>DataStorm-FE: A Data-and Decision-Flow and Coordination Engine for Coupled Simulation Ensembles.</i> Proceedings of the VLDB Endowment 11.12 (2018).
Poccia, S., Sapino, M. L., Liu, S., Chen, X., Garg, Y., Huang, S., ... , Candan, K. S. <i>SIMDMS: Data Management and Analysis to Support Decision Making through Large Simulation Ensembles</i> Proceedings EDBT 2017.
Garg, Yash, and Silvestro Roberto Poccia. <i>On the Effectiveness of Distance Measures for Similarity Search in Multi-Variate Sensory Data: Effectiveness of Distance Measures for Similarity Search.</i> Proceedings of the 2017 ACM on International Conference on Multimedia Retrieval. ACM, 2017.
F. Amato, A. De Santo, V. Moscato, F. Persia, S. R. Poccia and A. Picariello <i>Partitioning of ontologies driven by a structure-based approach</i> Short Paper,



Proceedings ICSC, 2015 IEEE International Conference on. IEEE, 2015
F. Amato, A. De Santo, F. Gargiulo, V. Moscato, F. Persia, S. R. Poccia and A. Picariello <i>SemTree: an index for supporting semantic retrieval of documents</i> Proceeding ICDEW 2015 31st IEEE International Conference on. IEEE, 2015.
Amato, F., De Santo, A., Moscato, V., Persia, F., Picariello, A., Poccia, S. R., Sperli, G. (2015). A structure-based approach for ontology partitioning. In SEBD (pp. 184-191)
F. Persia, F. Amato, F. Gargiulo, S. R. Poccia, and A. De Santo <i>Finding unexplained human behaviors in Social Networks</i> Proceedings of the 22nd Italian Symposium on Advanced Database Systems (SEBD2014), Discussion Paper

Journal proceedings
Chowell, G., Mizumoto, K., Banda, J. M., Poccia, S., & Perrings, C. <i>Assessing the potential impact of vector-borne disease transmission following heavy rainfall events: a mathematical framework</i> . Philosophical Transactions of the Royal Society B (2019).
Liu, S., Poccia, S., Candan, K. S., Sapino, M. L., Wang, X., <i>Robust Multivariate Temporal (RMT) Features of Multi-variate Time Series</i> Transactions on Multimedia Computing Communications and Applications 2017
S. Liu, S.R. Poccia, K. S. Candan, G. Chowell, M.L. Sapino (2016). <i>epiDMS: Data Management and Analytics for Decision-Making From Epidemic Spread Simulation Ensembles</i> . Journal of Infectious Diseases, 214(suppl 4), S427-S432

OTHER INFORMATION

Declarations given in the present curriculum must be considered released according to art. 46 and 47 of DPR n. 445/2000.

The present curriculum does not contain confidential and legal information according to art. 4, paragraph 1, points d) and e) of D.Lgs. 30.06.2003 n. 196.

Place and date: _____ Turin _____, ____15-11-2019_____

SIGNATURE

