

Call for one Research fellowship - Università Ca' Foscari Venezia (Italian law 30 December 2010, n.240, art. 22). PNRR Project no.: PE0000014 Title of the project: "Security and Rights in the CyberSpace (SERICS)" Subject: Università degli Studi di Salerno CUP: H73C22000890001. Call issued by Ca' Foscari University of Venice.

The present document in English is to be considered as a mere summary of the main provisions of the notice of competition which is available in Italian at the following link: <http://www.unive.it/data/12137/> The text in Italian is the official text of the notice of competition for all legal intents and purposes and, in the event of non-conformity with the present document, it shall prevail.

Contest title: "PNRR_ "Security and Rights in the CyberSpace (SERICS)" PE0000014" - Call for 1 Research fellowship funded by PNRR

- **funding** – PNRR_ Security and Rights in the CyberSpace (SERICS) - PE0000014-CUP: H73C22000890001
- **start of the programme:** The research programme envisages the start of the activity approximately in **October 2024**.

Description

Securing Microservice Compositions: A Formal Approach with Bigraphs, Process Algebras, and Temporal Logics

- **SSD:** INFO-01/A
- **Cod. GSD:** 01/INFO-01
- **duration:** 15 months
- **Stipend:** The research fellowship amounts to **Euro 23.367,00 per year**, gross to the recipient, net of the expenses to be sustained by the Provider. The amount may be subject to adjustment in the event of variations in the law
- **scientific coordinator and tutor:** Prof. Riccardo Focardi – Co Tutor: prof. Marino Miculan

abstract:

Microservice-oriented architectures, composed of numerous interacting containers, introduce new security challenges, such as information flow control, access control, authentication, and confidentiality between containers. This project aims to develop a compositional semantic model for representing these aspects, and a formalism to specify and verify their security policies. We will build upon existing formal graph-based models of containers, rooted in category theory, that offer a high-level abstraction for specifying and modeling compositional structures like containers. A starting point are bigraphs, such as those in [BMP20,AMP23], which capture the structure and interactions of containers. Our project will extend these models to scrutinize isolation, resource allocation, and

communication protocols, ensuring that compositions adhere to intended behavior and remain free of vulnerabilities. We plan to achieve this by integrating the biographic formalism with semantic models to represent container behaviors; possible models are event structures, process algebras, choreographic automata, etc. This extended paradigm, covering at once the structure and the behaviour of systems, will be the basis for the development of suitable proof methodologies for the required properties. Properties that cannot be statically verified might be enforced at runtime through appropriate monitoring automata.

Who can apply

Prospective candidates are expected to hold a **master's degree in Informatics or in Mathematics or similar** (or equivalent title according to the Italian law) or equivalent qualification obtained abroad and appropriate scientific-professional curriculum.

Ca' Foscari encourages applications from researchers with positive evaluation in all the criteria in individual proposals such as Marie Skłodowska Curie Actions - Individual Fellowships/ERC Starting Grants/FIRB (Italian Fund for basic research investments)/SIR (Scientific Young Independence Research) or similar.

Researchers having successfully completed Marie Skłodowska Curie Actions - Individual Fellowships/ERC Starting Grants/FIRB (Italian Fund for basic research investments)/SIR (Scientific Young Independence Research) or similar funded projects are warmly encouraged to apply.

Favourite headlines

- the Ph.D. degree (in Informatics or equivalent);
- completion of attendance at a doctoral program while awaiting the award of the degree;
- Research on the topics of the call and of the Enlarged Partnership Age-It (Consequences and challenges of ageing)
- specialization diplomas and certificates of attendance at postgraduate specialization courses, obtained both in Italy and abroad, the performance of documented research activities at public and private entities with contracts, scholarships or assignments both in Italy and abroad; - other titles.

Deadline for submission of applications: by and no later than 26/08/2024, h. 12:00 noon – local time.

How to apply:

Candidates should submit:

1. The application form;
2. A motivation letter (max 1 page) along with their CV in European format, duly dated and signed, both to enclosed as a one single.pdf file. (<http://www.unive.it/pag/28830>)
3. A copy of a valid identity document (either Identity Card or Passport);
4. If available, Evaluation Summary Reports of Marie Skłodowska Curie Actions - Individual Fellowships/ ERC Starting Grants/FIRB (Italian Fund for basic research investments)/SIR (Scientific

- Young Independence Research) individual proposals having passed all the evaluation thresholds;
5. If available, Doctoral degree;
 6. Declaration on availability to held the interview in remote (<https://www.unive.it/pag/28830>) to be send via email at the following address: **segreteria.dais@unive.it**:
 7. If available, Details of Marie Skłodowska Curie Actions - Individual Fellowships, ERC Starting Grants, FIRB (Italian Fund for basic research investments)/ SIR Scientific Young Independence Research funded projects;
 8. All documents, qualifications and publications relevant for the selection procedure (please, see the notice <http://www.unive.it/data/28825/>).

All the schemes of the quoted documentation are available on the website <http://www.unive.it/pag/28830>.

How to submit your application

Applications should be submitted by the online procedure, available on the notice webpage <http://www.unive.it/data/28825/>

Or submit here:

<https://apps.unive.it/domandeconcorso-en/accesso/dais2024-focardi-microservizi>

The candidate, after the uploading, will receive a submission number and an e-mail acknowledging receipt of his/her application.

The candidate if necessary, could access the procedures for updating any data and materials by the link provided by the e-mail, in any case any updates must be made no later than the deadline **26/08/2024, h. 12:00 noon – local time.**

If the deadline is on Saturday or on holidays, the deadline is extended to the first working day thereafter.

Please note:

- The candidate can contact the University for any support until 24 hours prior to the deadline.
- In case of an high number of applications and / or weight of the materials loaded by the candidates the system might become slower, Therefore it is suggested not to start the process close to the deadline;
- The University does not take on responsibility for wrong or late communication of addresses, nor for any communication problem not depending on the University.

Evaluation

Up to 100 points, specifically:

For qualifications, publications and possible tests, from 0 to 60;

For interview, from 0 to 40.



Selection procedure

The selection will take into account the cross-cutting priorities of the PNRR in relation to generational, gender and territorial equal opportunities.

The interview will be held in remote only. Further details on how to connect online will be published on the web page alongside the convocation notice.

The interview will be held in any case **on 13th September 2024 at 9.30 a.m. CET By Link GMeet**. The list of candidates admitted to the interview will be published by 11th September 2024.

Interview Topics

- formal methods for security
- semantic and categorical models
- graph-based models
- logics for security
- Good knowledge of Italian
- Good knowledge of English

Scientific products

The research fellow, at the end of his/her activity must also provide the department with the following scientific products:

- Research Fellowship Final Report

Information and contacts

Candidates may find further details about the application process and the research project in the official call published on the following webpage <http://www.unive.it/data/28825/>.

For further information please contact: Segreteria Amministrativa DAIS, phone number: 041-2348526-8531; e-mail: segreteria.dais@unive.it