



PhD in INGEGNERIA DELL'INFORMAZIONE / INFORMATION TECHNOLOGY - 39th cycle

Research Area n. 4 - Telecommunications

PNRR 118 PA Research Field: DEVELOPMENT OF TECHNIQUES FOR VERIFYING THE AUTHENTICITY OF MULTIMEDIA CONTENT AVAILABLE ONLINE IN THE AI AND FAKE NEWS ERA

Monthly net income of PhDscholarship (max 36 months)

€ 1400.0

In case of a change of the welfare rates during the three-year period, the amount could be modified.

Context of the research activity

Motivation and objectives of the research in this field

In the age of artificial intelligence and the widespread availability of online content, it has become increasingly challenging to discern authentic information from fake news. With the rise of deepfakes, manipulated images, and videos, it has become crucial to develop techniques to verify the authenticity of multimedia content. The aim of this research is to develop novel techniques for detecting and verifying the authenticity of multimedia content, particularly in the context of audio, images and videos. The objectives of this study include investigating the current state of the art in multimedia authentication, exploring the potential of signal processing and machine learning techniques for detecting counterfeit multimedia objects, and developing reliable and efficient methods for verifying the authenticity of multimedia content. This research has significant implications for improving media literacy and the trustworthiness of online information, which is crucial in the current era of misinformation and disinformation.

Methods and techniques that will be developed and used to carry out the research

This research project will employ a combination of techniques to develop and evaluate methods for verifying the authenticity of multimedia content. These techniques will include deep learning algorithms, computer vision



	<p>techniques, and data analysis techniques. The study will explore various approaches to extract and analyze multimedia features such as audio, visual, and metadata information to detect any inconsistencies or manipulations. To evaluate the proposed method, the study will use both simulated and real-world datasets of multimedia content, including images, videos, and audio clips. The research will also explore the limitations and potential bias of the developed techniques and methods and provide recommendations for future work. Overall, this study will contribute to the development of effective techniques for verifying the authenticity of multimedia content in the era of AI and fake news.</p>
Educational objectives	<p>The educational objectives of this research project are two-fold. First, the project aims to provide valuable insights into the development and application of techniques for verifying the authenticity of multimedia content, which is a critical area in the current era of AI and fake news. Through the investigation of state-of-the-art techniques, the project will contribute to the body of knowledge in this field, which can be used to improve media literacy and combat misinformation. Second, this research project will offer an excellent opportunity for the researchers involved to gain practical experience in conducting research, analyzing data, and developing innovative solutions. By utilizing a combination of techniques, including deep learning, computer vision, and data analysis, the researchers will acquire critical skills that are highly sought after in the current job market. Ultimately, this research project aims to contribute to the education and training of the next generation of researchers and professionals in the field of multimedia content verification.</p>
Job opportunities	<p>There are several job opportunities related to the field of multimedia content verification, particularly in the current era of AI and fake news. These include the public administration (e.g., better control over digital data, digitalization of services for content authenticity assessment, etc.), law enforcement agencies, software development companies and academia research in the</p>



	field of multimedia content analysis.
Composition of the research group	2 Full Professors 1 Associated Professors 8 Assistant Professors 12 PhD Students
Name of the research directors	Stefano Tubaro, Paolo Bestagini

Contacts	
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Additional support - Financial aid per PhD student per year (gross amount)	
Housing - Foreign Students	--
Housing - Out-of-town residents (more than 80Km out of Milano)	--

Scholarship Increase for a period abroad	
Amount monthly	700.0 €
By number of months	6

National Operational Program for Research and Innovation	
Company where the candidate will attend the stage (name and brief description)	Fondazione Bruno Kessler (FBK) - Security & Trust Research Unit
By number of months at the company	6
Institution or company where the candidate will spend the period abroad (name and brief description)	Fraunhofer Institute for Digital Media Technology IDMT
By number of months abroad	6

Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information
Image and Sound Processing Group (http://ispl.deib.polimi.it/) EDUCATIONAL ACTIVITIES (purchase of study books and material, including computers, funding for participation in courses, summer schools, workshops and conferences): financial aid



per PhD student

TEACHING ASSISTANTSHIP: availability of funding in recognition of supporting teaching activities by the PhD student There are various forms of financial aid for activities of support to the teaching practice. The PhD student is encouraged to take part in these activities, within the limits allowed by the regulations.

COMPUTER AVAILABILITY: individual use

DESK AVAILABILITY: individual use