europass

Nikolaos Schetakis

Date of birth: 26/03/1984 | **Nationality:** Greek | **Gender:** Male |

(+30) 6973660695 | nischetakis@gmail.com |

Aristotelous 84, 73100, Chania, Greece

WORK EXPERIENCE

15/03/2019 – CURRENT – Rome, Italy

TECHNICAL LEADER – ALMA SISTEMI SRL

1. Software development
2. Team leader

Projects:
September 2020 - September 2021 **: Plasma Antenna TecHnologies, Program:** Horizon 2020, **Call:** H2020-MSCA-RISE-2016
September 2021 - Present **: Economy By Space, Program:** Horizon 2020, **Call:** H2020-MSCA-RISE-2020
July 2021 - Present **: STructural stABiLity risk assEssment, Program:** Horizon 2020, **Call:** H2020-MSCA-RISE-2018
MArch 2019 - Present **: INTIME, Program:** Horizon 2020, **Call:** H2020-MSCA-RISE-2018

15/10/2015 – 01/06/2021 – Chania

TEACHING ASSOCIATE – TECHNICAL UNIVERSITY OF CRETE (TUC)

Physics Lab II , School of Electrical and Computer Engineering
Physics Lab I and II , School of Mineral Resources Engineering

2013 – 2019 – Athens , Greece

SOFTWARE DEVELOPER – SUNRISE TECHNOLOGIES

1. Project: Pen test Live. http://www.pentestlive.com/ . Online tool that evaluates your IT infrastructure security vulnerabilities, flaws and risks. With Custom Forum & Wiki web platform for security articles & tools. Use of ER model and SQL for database normalization and data management.
2. Project: Identity and access manager. automated and codeless provisioning of user identities, role assignment, group
memberships and access privileges. Use of: Reverse engineering techniques, Visual Basic.
3. Project: Data-miner. A light tool to discover and manage big data involving statistics methods. Use of SQL.

07/2018 – 01/2020 – Chania, Greece

SCIENTIFIC RESEARCHER – TECHNICAL UNIVERSITY OF CRETE (TUC)

Project name: “Quantum Polaritonic Simulators”. Greece-Russia Collaboration. : Use of Advanced Numerical tools in Python & Matlab.

EDUCATION AND TRAINING

2008 – Heraklion, Greece

BACHELOR – University of Crete (UOC) - Physics dpt.

2009 – 2012
MASTER OF SCIENCE (MSC) – Technical University of Crete (TUC)

Field(s) of study
- Quantum Physics

Thesis: Atom-photon interactions in coupled optical micro-cavity arrays: A study of populations and entanglement dynamics of the two cavity case

8.92

LANGUAGE SKILLS

Mother tongue(s): **GREEK**

Other language(s):

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken production	Spoken interaction	
ENGLISH	C2	C2	C2	C2	C2
GERMAN	A2	A2	A2	A2	A2

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

DIGITAL SKILLS

Programming (C, Java, Python, OCaml, OpenGL) | Good experience in spatial analysis (QGIS) | Machine Learning | Quantum computing

PUBLICATIONS

Binary classifiers for noisy datasets: a comparative study of existing quantum machine learning frameworks and some new approaches

https://arxiv.org/abs/2111.03372 – 2021
One of the most promising areas of research to obtain practical advantage is Quantum Machine Learning which was born as a result of cross-fertilisation of ideas between Quantum Computing and Classical Machine Learning. In this paper, we apply Quantum Machine Learning (QML) frameworks to improve binary classification models for noisy datasets which are prevalent in financial datasets. The metric we use for assessing the performance of our quantum classifiers is the area under the receiver operating characteristic curve (ROC/AUC). By combining such approaches as hybrid-neural networks, parametric circuits, and data re-uploading we create QML inspired architectures and utilise them for the classification of non-convex 2 and 3-dimensional figures. An extensive benchmarking of our new FULL HYBRID classifiers against existing quantum and classical classifier models, reveals that our novel models exhibit better learning characteristics to asymmetrical Gaussian noise in the dataset compared to known quantum classifiers and performs equally well for existing classical classifiers, with a slight improvement over classical results in the region of the high noise.

AN OPEN-SOURCE PLATFORM ADDRESSING STRUCTURAL STABILITY RISK ASSESSMENT IN HISTORICAL CENTERS

https://www.researchgate.net/publication/357900482_AN_OPEN-SOURCE_PLATFORM_ADDRESSING_STRUCTURAL_STABILITY_RISK_ASSESSMENT_IN_HISTORICAL_CENTERS – 2021

Overview of Main Radiation Transport Codes

https://gi.copernicus.org/articles/9/407/2020/gi-9-407-2020-discussion.html – 2020
Accurate predictions of expected radiation dose levels on Mars are often provided by specific radiation transport codes that have been adapted to space conditions. Unsurprisingly, several of the main space agencies and institutions involved in space research and technology tend to work with their own in-house radiation codes. We present the codes that are related to the simulation of the radiation on Mars' surface under different scenarios. All of these codes have similar fields of application, but they differ with respect to several aspects, including the energy range and types of projectiles considered as well as the models of nuclear reactions considered.

Few-photon transport in many-body photonic systems: A scattering approach

https://journals.aps.org/pra/abstract/10.1103/PhysRevA.92.063817 – 2015
We study the quantum transport of multiphoton Fock states in one-dimensional Bose-Hubbard lattices implemented in QED cavity arrays (QCAs). We propose an optical scheme to probe the underlying many-body states of the system by analyzing the properties of the transmitted light using scattering theory. To this end, we employ the Lippmann-Schwinger formalism within which an analytical form of the scattering matrix can be found. The latter is evaluated explicitly for the two-particle, two-site case which we use to study the resonance properties of two-photon scattering, as well as the scattering probabilities and the second-order intensity correlations of the transmitted light. The results indicate that the underlying structure of the many-body states of the model in question can be directly inferred from the physical properties of the transported photons in its QCA realization. We find that a fully resonant two-photon scattering scenario allows a faithful characterization of the underlying many-body states, unlike in the coherent driving scenario usually employed in quantum master-equation treatments. The effects of losses in the cavities, as well as the incoming photons' pulse shapes and initial correlations, are studied and analyzed. Our method is general and can be applied to probe the structure of any many-body bosonic model amenable to a QCA implementation, including the Jaynes-Cummings-Hubbard model, the extended Bose-Hubbard model, as well as a whole range of spin models.

Frozen photons in Jaynes–Cummings array

https://iopscience.iop.org/article/10.1088/0953-4075/46/22/224025/pdf – 2013
We study the origin of 'frozen' photonic states in coupled Jaynes–Cummings–Hubbard arrays. For the case of half the array initially populated with photons while the other half is left empty, we show the emergence of a self-localized photon or 'frozen' states for specific values of the local atom–photon coupling. We analyse the dynamics in the quantum regime and discover important additional features that do not appear to be captured by a semi-classical treatment, which we analyse for different array sizes and filling fractions. We trace the origin of this interaction-induced photon 'freezing' to the suppression of the excitation of propagating modes in the system at large interaction strengths. We discuss in detail the possibility of experimentally probing the relevant transition by analysing the emitted photon correlations both in the idealized lossless case and more realistic scenarios when reasonable losses are included. We find a strong signature of the effect in the emitted photons statistics.

ADVANCES IN CLOUD COMPUTING FOR MARS DATA PROCESSING

https://www.elibrary.ru/item.asp?id=45672763 – 2020

HONOURS AND AWARDS

2012
Scholarship of Distinction – Technical University of Crete (TUC

2012
Teaching Assistant Scholarship – Technical University of Crete (TUC)

2011
Basic Research Scholarship – Technical University of Crete (TUC)

PROJECTS

2021 – CURRENT

Exploring the Advantage of a Quantum System for Machine Learning applied to Credit Scoring

Binary classification using quantum and classical machine learning. Collaboration with Singapore Management University (SMU) and Tradeteq, London (https://www.tradeteq.com/)

2019 – 2020

Diagnosis of Cardiovascular Diseases Based on R-R Interval Using ECG and PPG Signals

A self-proposed method for automated diagnosis of various diseases based on heart rate and heart rate variability (HRV) analysis and machine learning. HRV analysis – consisting of time-domain analysis, frequency-domain analysis, and nonlinear analysis – is employed because its resulting parameters are unique for each disease and can be used as the statistical symptoms for each disease, while machine learning techniques are employed to automate the diagnosis process. The input data consist of electrocardiogram (ECG) recordings and Photoplethysmography (PPG) recordings collected via a microcontroller.

09/2020 – 09/2021

Plasma Antenna TecHnologies

PATH is intended to promote a collaborative research focused in the development of high density plasma sources. PATH aims at cross linking different competences to study and develop prototype of plasma sources and plasma antennas based on hybrid technologies based on Radiofrequency and Hollow cathode technologies.

Program: Horizon 2020
Call: H2020-MSCA-RISE-2016

07/2021 – CURRENT

Economy by Space (EYE)

The project EYE intends to propose a prototype service based on Copernicus data, automatic image processing supported by artificial intelligence and machine learning integrated with modelling, statistics and geospatial data into an IT platform able to provide econometric and epidemiologic nowcasting and forecasting data.

Program: Horizon 2020
Call: H2020-MSCA-RISE-2020 (Marie Skłodowska-Curie RISE)

06/2021 – CURRENT

STructural stABiLity risk assEssment (STABLE)

STABLE addresses the design and development of a Thematic Platform, combining structural stability models, damage assessment simulation tools, advanced remote sensing, in-situ monitoring technologies, geotechnics and cadastral data sets with WebGIS application for mapping and long term monitoring of cultural heritage (CH). This will enable effective monitoring and management of the CH to prevent, or at least reduce, catastrophic damages.

Programme: H2020 MSCA – RISE #823966

03/2021 – CURRENT
IN-TIME

IN-TIME (IN-siTu Instrument for Mars and Earth dating Applications) : Project addresses the technological and economic viability of a leading-edge instrument for dating of Mars' sub-surface samples: a miniaturized, portable instrument for in-situ examination and assessment based on the luminescence method.

Program: Marie Sklodowsska-Curie Actions
Call: H2020-MSCA-RISE-2018

CONFERENCES AND SEMINARS

23/08/2021 – 10/09/2021
PATH project: "Plasma Antenna TecHnologies" Summer school

07/06/2015 – 13/06/2015
7th Summer School on Quantum and Non-Linear Optics (QNLO), Denmark/Sørup Herregaard

04/06/2016 – 11/06/2016
Quantum simulations and many-body physics with light, Chania, Greece (Member of organizing committee)

28/07/2011 – 10/08/2011
"Scottish Summer School in Physics – Quantum Coherence and Information (SUSSP67)", Scotland/Glasgow

21/05/2012 – 08/06/2012
Singapore School of Physics – Strong Light-Matter Coupling, Singapore

CREATIVE WORKS

2019 – 2020
STEM projects

Leading a small team of students from Technical University of Crete. Goal is to educate students in science, technology, engineering, and mathematics.
https://www.youtube.com/channel/UCLZ6FVSDlHAXZLd0_mto5hg