

THEODOROS
PANAGIOTAKOPOULOS

Ph.D Physicist ~ Modeling Engineer

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SUMMARY

Experienced **Ph.D. Physicist** specializing in **semiconductor physics**, expert in **Machine Learning** and **Data Analysis**, seeking a role to drive impactful solutions.

SKILLS

Languages: Python, Julia, R, C/C++, SQL, Bash, HTML
Tools: Machine Learning, Data Analysis, Visualization
Platforms: Linux, Git, HPC

EDUCATION

08/2019 - present	Ph.D: Physics/Material Science GPA: 4.0/4.0	University of Central Florida
10/2017 - 07/2019	M.S.: Physics GPA: 9.2/10, Valedictorian	National and Kapodistrian University of Athens
10/2011 - 07/2017	B.S. Physics	National and Kapodistrian University of Athens

INDUSTRY EXPERIENCE

5/2024 - 8/2024	Modeling Product Engineer Intern	ASML, Silicon Valley, CA
<ul style="list-style-type: none">Optimized optical simulations for geometrical corner rounding, reducing runtime by 5%, memory usage by 10%, and rounding time by 70%. These improvements were integrated into ASML's latest software release and adopted by customers.Led optical simulations to optimize the Transition Cross Coefficient (TCC), reducing runtime by 9% and memory usage by 34%. Integrated into ASML's latest software release for a major customer.Engineered a custom Python library to analyze large simulation datasets and automate pattern recognition across various system configurations.Collaborated with the optics team to improve the efficiency of computational lithography models. <p>Python / C/C++ / Bash</p>		

EXPERIENCE

8/2019 - present DOE -NSF Funded	Research Assistant	University of Central Florida
<ul style="list-style-type: none">Modeled the epitaxial growth of metals on semiconductors for junction development, minimizing defects and improving charge transport properties.Implemented Deep Learning using Neural Networks to model the epitaxial growth of metals on semiconductors, surpassing Density Functional Theory in speed and optimizing semiconductor fabrication simulations.Developed and trained a Machine Learning Classifier to predict metal growth on semiconductors by modeling long-range charge interactions, accelerating fabrication simulations for junction development, and improving computational efficiency.Developed a Machine Learning model using a Graph Convolutional Neural Network for data retrieval, now integrating it into a simulation tool to enhance the speed of fabrication process simulations.Developed three custom Python libraries: one for modeling complex systems in fabrication processes, one for electrochemistry, and one for rendering and visualizing 3D simulation data as 2D images.Designed algorithms to maintain constant voltage in electrochemical simulations and integrated them into the simulation tool, demonstrating the superior effectiveness of non-metallic cations over metallic counterparts in the CO₂ reduction reaction.Engineered Machine learning models to predict CO₂ reduction into formate and carbon monoxide in large-scale systems, directly applicable to real-world problems for predictive modeling.Developed numerical methods and algorithms for CO₂ adsorption energy calculations, achieving high precision in modeling cation effects in the CO₂ reduction reaction.Created a centralized SQL database by organizing existing group member data, enhancing accessibility and facilitating result validation. <p>Python / Julia / C/C++ / Bash</p> <p>GitHub</p>		
10/2017 - 7/2019 NKUA Funded	Research Assistant	National and Kapodistrian University of Athens
<ul style="list-style-type: none">Designed simulations and developed a Machine Learning approach for identifying dark matter particles.Taught modeling and applications of Machine Learning, with a focus on feature engineering techniques. <p>Python / C/C++ / Bash</p> <p>GitHub</p>		

TECHNICAL SKILLS


- Strong knowledge of **data structures**, designing and implementing efficient solutions for complex data challenges.
- Proficient in **data integration** techniques with SQL, extracting, loading, and transforming data for efficient processes.
- Expertise in **algorithm design** and **data science software architecture** for optimized data workflows.
- Proficient in **High-Performance Computing** (HPC), specializing in **Slurm** for job scheduling, resource allocation, and **optimization**.
- Proficient in **Git**, maintaining organized code repositories for collaborative data-driven projects.
- Proficient in creating compelling data visualizations with **Tableau**, **Matplotlib**, and **Gnuplot** to clearly communicate complex insights.

MANAGEMENT SKILLS

- **Supervising and independently completing projects**, consistently meeting budget and deadline goals with high-quality execution.
- Proficient in **conceptualizing, planning, and executing** end-to-end data science initiatives to solve critical business challenges.
- Thriving in **diverse teams**, fostering collaboration and energizing **collective success**.
- Exceptional **communication and presentation skills**, bridging knowledge gaps and **ensuring clarity**.
- Excelled in **problem solving** and **analytical thinking** in dynamic evolving environments.
- **Excels in both written and verbal communication**, proficiently acquires knowledge and imparts insights with clarity.

SELECTED - PUBLICATIONS

Electronic structure of cobalt valence tautomeric molecules in different environments

 **Theodoros Panagiotakopoulos**, Esha Mishra, Thilini K Ekanayaka, Duy Le, Talat Shahnaz Rahman, Ping Wang, Kayleigh McElveen, Jared Paul Phillips, Zaid Zaz, Saeed Yazdani, Alpha T. N'Diaye, Rebecca Y. Lai, Robert Streubel, Ruihua Cheng, Michael Shatruk and Peter A. Dowben

 2022

 Nanoscale

 [link](#)

Exploring Simulated Residential Spending Dynamics in Relation to Income Equality with the Entropy Trace of the Schelling Model

 **Theodoros Panagiotakopoulos**, George-Rafael Domenikos , Alexander V. Mantzaris

 2022

 MDPI

 [link](#)

Direct and indirect detection of dark matter

 **Theodoros Panagiotakopoulos**, Vasilios Spanos

 2019

 Pergamos library, National and Kapodistrian University of Athens

 [link](#)

Description of the method development for separating the Dalitz from the normal π^0 in the CDF detector

 **Theodoros Panagiotakopoulos**, Arkadios Manousakis

 2017

 Pergamos library, National and Kapodistrian University of Athens

 [link](#)