THEODOROS PANAGIOTAKOPOULOS

Ph.D Physicist ~ Modeling Engineer

🌐 TheoPhD.com ✉ teosfp@hotmail.com

📞 321 202 3216 ○ theodorosP

📍 Orlando, FL, USA in TheoPhD

Ⓗ hackerrank

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++, C#, SQL, Bash
Tools:	Machine Learning, Data Analysis, Visualization
Platfroms:	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**

- Optimized optical simulations for geometrical corner rounding, achieving a **5% reduction in runtime**, **10% reduction in memory usage**, and **70% reduction in rounding time**. These enhancements were integrated into ASML's latest software release and adopted by customers.
- Led electromagnetic simulations and optimized the Transition Cross Coefficient (TCC), reducing runtime by **9%** and memory usage by **34%**. These improvements were incorporated 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 **cross-functional teams** to enhance the efficiency of computational lithography models.

```
Python  /  C/C++  /  Bash
```

EXPERIENCE

8/2019 – present **Research Assistant** **University of Central Florida**
DOE -NSF Funded

- Modeled the **epitaxial growth of metals on semiconductors**, minimizing defects, enhancing charge transport, resulting in improved material design processes.
- Designed and implemented a **Deep Learning Neural Network** surpassing Density Functional Theory (DFT) in speed, optimizing semiconductor fabrication simulations and accelerating material discovery workflows.
- Developed and trained a **Convolutional Neural Network (CNN)** to predict metal-semiconductor deposition morphology images with simulation-level accuracy, using voxelized atomic properties for large-scale applications.
- Engineered a **Graph Convolutional Neural Network (GCNN)** for data retrieval integrating it into a simulation tool to accelerate simulations of epitaxial metal growth on semiconductors.
- **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.
- Developed an **Algorithm** for voltage control in electrochemical systems, enabling precise modeling of cathodic reactions in thin-film deposition processes.
- Developed **Numerical Methods** for adsorption energy calculations, modeling the effects of metallic and non-metallic cations to enhance material performance in electrodeposition processes.
- Modeled energy pathways of adsorbates in **electrodeposition**, highlighting the superior effects of non-metallic cations and identifying reaction mechanisms and energy barriers critical to thin-film growth.
- Developed an innovative proton-shuttling pathway to optimize **electrocatalytic** simulations, directly applicable in enhancing **electrodeposition** processes and providing new insights into interconnects creation.
- Created a centralized **SQL** database by organizing existing group member data, enhancing accessibility and facilitating result validation.

```
Python  /  Julia  /  C/C++  /  Bash  /  SQL                    GitHub
```

10/2017 – 7/2019 **Research Assistant** **National and Kapodistrian University of Athens**
NKUA Funded

- Designed simulations and developed a **Machine Learning** approach for identifying dark matter particles.
- Taught **modeling** and applications of **Machine Learning**, focusing on **feature engineering techniques**.

```
Python  /  C/C++  /  Bash                                      GitHub
```

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 linear programming

- Proficient in High-Performance Computing (HPC), specializing in Slurm for job scheduling, resource allocation, and optimization.

- Experienced in **parallel programming** and **GPU acceleration**,

- Proficient in **Git**, maintaining organized code repositories for collaborative data-driven projects.

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 Daliz from the normal π^0 in the CDF detector

Theodoros Panagiotakopoulos, Arkadios Manousakis

2017   Pergamos library, National and Kapodistrian University of Athens   link