

HIAS Ashford Scholarship Report

Marios Rozos

Being a recipient of the Nicholas and Robert Askounes Ashford Educational Scholarship has been an extraordinary opportunity for which I am deeply grateful. The scholarship allowed me to spend two months at Yale University, where I conducted research in learning theory under the mentorship of Professor Manolis Zampetakis.

Learning theory is a branch of theoretical computer science that explores the mathematical foundations of machine learning. It addresses questions such as what makes a problem learnable, how much data is required, and how learning algorithms can generalize to new, unseen data. During my time at Yale, I focused on two main areas within learning theory: testable learning and online learning.

In many machine learning models, assumptions about data distributions are common, yet testing even basic assumptions can often be intractable. Testable learning is a framework designed to address this challenge by replacing difficult-to-verify assumptions with ones that can be efficiently tested. In this model, a learning algorithm must perform well whenever the data passes these simpler tests, leading to more reliable and provable learning outcomes. On the other hand, online learning addresses scenarios where decisions must be made sequentially as new information becomes available, requiring algorithms to adapt in real-time. My research focused on the intersection of these two frameworks, aiming to develop testing methods for certain online learning settings.

Beyond research, I had the privilege of participating in Yale's academic life. I attended theoretical computer science seminars and research courses on different topics of theoretical computer science, including classical and quantum error-correcting codes, and computational-statistical tradeoffs of statistical methods. These courses and lectures gave me a glimpse of cutting-edge research in other areas of theoretical computer science, but also showcased the intricate connections between computer science, mathematics, and physics. Equally rewarding was the chance to meet and engage with a diverse community of PhD students and professors and to learn about their research.

This scholarship has been a valuable influence on my career aspirations. It has given me the opportunity to engage with state-of-the-art research, which has solidified my interest in pursuing an academic path and exploring different areas of theoretical computer science and theoretical machine learning. Additionally, the mentorship and academic support I have received have provided me with helpful technical insights and a better understanding of the research process.

Conducting research at one of the world's leading universities was an extraordinary experience. Immersing myself in the student environment at Yale was both exciting and eye-opening, and it has encouraged me to strive to be a better researcher as well as to contribute more to the academic community.

I am immensely grateful to the Hellenic Institute of Advanced Studies for this extraordinary opportunity. It has been a pivotal chapter in my academic journey, one that will undoubtedly continue to shape my future endeavors.

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