

Motivation Letter for PhD Application

Dear Dr. Rosy Nikolaidou

I am writing this letter to express my strong interest in the Ph.D. position : "ARTIFICIAL INTELLIGENCE TO SIMULATE BIG DATA AND SEARCH FOR THE HIGGS BOSON DECAY TO A PAIR OF MUONS WITH THE ATLAS EXPERIMENT AT THE LARGE HADRON COLLIDER"

About me

I graduated last year with a Master's degree in "high energy and computational physics" from Cadi Ayyad University in Morocco. Pursuing my Ph.D. with experts and doing research on the latest topics of physics is my childhood dream.

My current research interests are in supervised and unsupervised machine learning in high energy physics. It took me a long journey during my career before I came to this well-defined area of interest. It started in the second year of my Physics B.Sc. During that time, like every student, I had a vague interest in high energy physics. I did not know yet if this interest was more theoretical or experimental. Nevertheless, After Google's AI AlphaGo became the first Computer Go program to beat a professional human player, I started to learn about machine learning and applied it in many physics and no physics problems.

I feel comfortable processing several challenging things at once. This ability helps me to be successful in my study (First in my class of master) and acquire extra-curricular knowledge in the computer science field (about 5 years of experience with programming), since I was in college until now, I have joined several online classes related to computer science such as programming, machine learning, and algorithms, and so on.

For more information about me please visit my website

Why this thesis?

This thesis combine two of my favorite field: experimental particle physics & machine learning, and I think CEA can help me with these ambitions since it has a strong ATLAS group with access to formidable computational resources. Also new computational challenges presented by this thesis , and thinking about innovative ways to tackle them are a great motivation for me.

Why me

I worked in many projects that combine ML & HEP like the Higgs Boson machine learning challenge,

Besides my thorough theoretical knowledge got during my master in high energy and computational physics, I also possess strong numerical and data analysis skills obtained during multiple research projects, also I have a lot of experience in programming languages (Python and C++) and frameworks (ROOT, tensorflow ..), and I have a strong desire for professional development. I believe that my diligence, my practical research experience, and organizing abilities, high enthusiasm, and interest in experimental particle physics are most conducive to make me an ideal candidate for this Ph.D.

After completing my Ph.D., I plan to pursue a postdoc likely in the area of unsupervised machine learning in data analysis of the ATLAS experiment. Driven by a lifelong interest in experimental particle physics, I am keen to continue my education in this subject and to perform my own research which can contribute to the knowledge of the field.

I am available immediately to start an internship before the beginning of the PhD, and I will gladly answer questions you may have and hope to hear from you soon.

Sincerely,