PROPUESTA PROYECTO DE GRADO: A PROGRAMMING LANGUAGE FOR REINFORCEMENT LEARNING

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1 CONTEXT

The AI hype is starting to find its limits. A reason for these limits comes from the lack of appropriate programming models to represent and express the concepts of learning algorithms. One example of this appears in Reinforcement Learning (RL) programs, which often lack the standards and quality od regular software projets.

This problem arises, in part, from the poor tools to express and represent the programs built using RL techniques.

2 PROJECT PROPOSAL

To counter these problems, we want to design and implement appropriate language level abstractions for RL. The end goal of such development is to offer developers better tools and abstractions to express and represent RL algorithms, techniques within a program. These include the abstraction of the state and action space, the representation of the learning technique, and its (hyper)parameters in such a way that programmers can focus on the intrinsic complexity of the programs, rather than on the RL-specific details.

3 IMPLEMENTATION PLAN

The implementation of the language will include:

- Build the language abstractions and data structures to express RL constructs
- Build a set of test programs to evaluate our environment

4 BACKGROUND AND LITERATURE

[1] Racket, the programming language. https://racket-lang.org/

[2] PrePLAI: Scheme y Programación Funcional. https://users.dcc.uchile.cl/~etanter/preplai/

[3] Programming Languages: Application and Interpretation, Shriram Krishnamurthi, Brown University, 2023. https://cs.brown.edu/~sk/Publications/Books/ProgLangs/2007-04-26/plai-2007-04-26.pdf