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Optimization & Artificial Intelligence for a Better World

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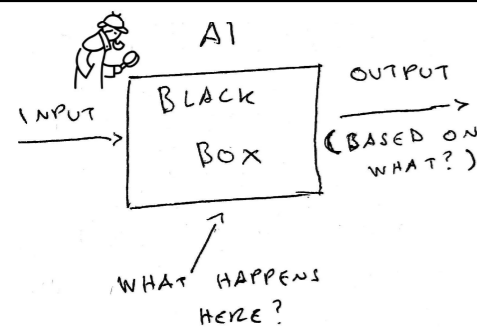
PhD programs
Inf. Eng. / Sm. Comp.



Global Optimization Laboratory

The Global Optimization Laboratory (GOL) deals with Operations Research and AI Applications in diverse and exciting contexts. From methodologies for highly complex decisional problems to AI methods for daily life and green applications, students have the possibility of tackling the most modern challenges of our world. Here below, a pick of the current projects we are working on.

Optimization for Interpretable Machine Learning

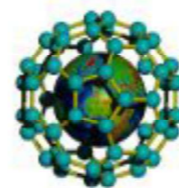


Tired of unexplainable predictions?

Use glass-box models instead!

Trust your AI. Understand why.

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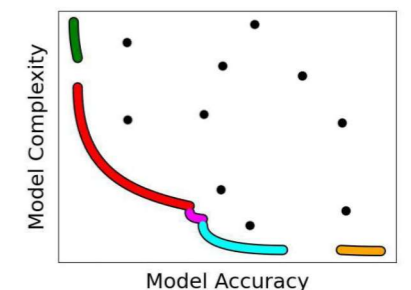


GOL



Multi-Objective Optimization

- Goal: Pareto front, to obtain optimal tradeoffs among contrasting goals.
- Gradient-based and Memetic Algorithms.
- Methodologies for Sparse Solutions.



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Continual Learning For Deep Neural Networks

Deep Networks do not **continue** learning over time and fast **forget** what they have learned.

Do not Forget.

Continual Learning is all you need.

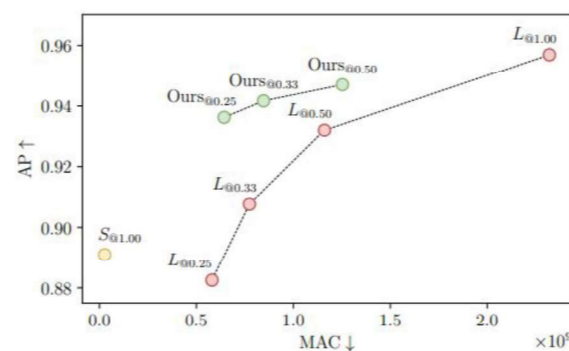


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Green AI Applications

ChatGPT consumed as much electricity as 175K people in January. **Green AI**, appeals to researchers to obtain novel results without increasing computational cost.

Here, an example of **Precision vs MAC** count that we obtained in a project in Computer Vision.



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Accident Anticipation from Dashcam Videos

- Other methods rely on object detection.
- Our method uses **only video** in a **self-supervised** manner.
- This enables training end-to-end on **bigger unlabeled datasets.**



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