

# CRISTOBAL EYZAGUIRRE

## Computer Science Ph.D. Student

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## SELECT RESEARCH PUBLICATIONS

### Ph.D. Student

#### Stanford Vision and Learning Lab - Stanford University

September 2021 – Ongoing

Stanford, CA

- **Ongoing:** Figured out a way to use Video Generative Models for Unsupervised Point Tracking. We pose that this is a relevant metric for evaluating world modeling in Video Diffusion Models.
- **Ongoing:** Proposed novel architecture for adaptation of VideoLLMs into efficient online video understanding models.
- **Poster (NeurIPS24):** Proposed benchmarks, metrics and models for a novel task at the intersection of online video and language.
- **Under Review (ICLR):** Proposed a metric for estimating the complexity of questions in VideoQA. We leverage it to generate a new dataset of only complex questions.
- **Oral (CVPR2022):** We characterized the degree to which video understanding can be addressed from only image semantics. The proposed model achieved SOTA results in several video-language tasks.

### AI Researcher

#### AI Lab - Pontifical Catholic University of Chile (PUC)

July 2017 – May 2021

Santiago, Chile

- **ACL Workshop:** Significantly reduced computation and improved explainability when applying pretrained Transformer Models models by using adaptive algorithms.
- **Publication (CVPR2020):** Proposed alternative algorithm for Adaptive Computation Time on recurrent models for Visual Reasoning. Ablation experiments showed that the resulting models outperform baselines in both performance and transparency.

## PROJECTS

### Open Source Contributions

- PyTorch implementation and CUDA kernel for Quasi Recurrent Neural Networks.
- PyTorch implementation of Memory, Attention and Composition (MAC) Network capable of 99% accuracy on CLEVR dataset.
- Only working full implementation of Adaptive Computation Time for Recurrent Neural Networks using PyTorch.
- Invented and coded a new visualization tool for multi-label geographic data (see Percentage Gridmap).

### Software Engineering

- **Iris:** Led, coordinated and managed a team of 10 programmers (computer science students) during four months in building a scalable platform with both mobile and web (SPA) frontends.
- **TuPUC:** Developed application (web + native Windows and MacOS) to generate and rank schedule suggestions which achieved over a thousand users less than a week after deployment.

## WORK EXPERIENCE

### Toyota Research Institute

#### Computer Vision

July 2023 – Sep. 2023

Los Gatos, CA

- Work on improving performance of VLMs and CodeGen models. Project publication under review at ECCV.

### Google AI Research Internship

#### Computer Vision

Oct. 2020 – Jan. 2021

Mountain View, CA

- Improved accuracy and efficiency of models for video understanding through the introduction of additional modalities.

### Zippedi Research Internship

#### Computer Vision and Navigation

Jan. 2020 – Mar. 2020

Santiago, Chile

- Implemented computer vision algorithms for the automatic recognition of products in store shelves.

## EDUCATION

### Doctor of Philosophy (Ph.D.) in Computer Science

#### SVL Lab - Stanford University

Sep. 2021 – Ongoing

Stanford, CA

**Co-supervised** by Juan Carlos Niebles and Jiajun Wu.

Emphasis on efficient Vision and Video Understanding.

### Master of Engineering in Computer Science

#### AI Lab - Pontifical Catholic University of Chile (PUC)

July 2019 – May 2021

Santiago, Chile

**Supervised** by Álvaro Soto, Ph.D. CMU.

Graduated with highest distinction.

### Bachelor of Engineering in Computer Science & Software Engineering

#### Pontifical Catholic University of Chile

Jan. 2015 – Dec. 2019

Santiago, Chile

Minor in Data Science. Graduated with distinction.

## TEACHING EXPERIENCE

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- Teacher: Professional Education Artificial Intelligence Program (2020-2021).
- Teaching Assistant: Deep Learning 2020.
- Teaching Assistant: Artificial Intelligence 2019-2020.
- Coach and Product Manager for Capstone Project 2019 (ABET certified, two semesters 13 and 10 students respectively).

## SKILLS

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### Programming Languages

Proficient/expert in Python, C, C++, JavaScript.

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### ML Tools, Packages and Resources

Proficient with PyTorch, NumPy, SKLearn. Comfortable with Tensorflow, Keras, Spacy, NLTK, Flume and Slurm.