RAFAEL GALLARDO GARCÍA

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Rafael Gallardo-García

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EXPERIENCE

Undergraduate Researcher

Language and Knowledge Engineering Laboratory, BUAP

10/2018 – Ongoing University City, BUAP, Puebla Mexico

- Four papers published on indexed journals (peer reviewed).
- One paper on conference proceedings (ANIEI 2019).
- Three papers accepted on international conferences, pending of publication on indexed journals and conference proceedings.
- My research topics include: Computer vision and natural language processing, trying to solve problems with deep learning.

Python Developer (Self-employed)

Faculty of Computer Science, BUAP

10/2017 - Ongoing

Faculty of Computer Science, University City, BUAP, Puebla, Mexico

- Analyze and modify existing software and libraries, adapting them to different purposes.
- Python implementation of research projects.
- From-scratch implementations of machine learning algorithms such as: k-nearest neighbors, support vector machines, DBSCAN, k-Means and deep learning architectures.
- Experience with training of large models in cloud servers.

Courses and Workshops

2019 - 2020

Throughout my undergraduate degree, I have participated in a wide variety of courses and workshops.

- Mexican Workshop on Data Science and Big Data at the Center of Mathematical Research (2020).
- School of Deep Learning applied to Language Technologies at the National Institute of Astrophysics, Optics and Electronics (2020).
- National School of Computational Intelligence and Learning at the National Institute of Astrophysics, Optics and Electronics (2020).
- Old Dominion University Remote Experience for Young Engineers and Scientists Program (2020).
- National School of Computational Intelligence and Learning at the Benemérita Universidad Autónoma de Puebla (2019).
- International Workshop on the State of Research in Computational Learning at the Language and Knowledge Engineering Laboratory (2019).

SKILLS

Soft skills

Problem solving | **Self-directed learning** | **Initiative** | **Goal setting** | **Motivation** | **Independence** | **Leadership**

EDUCATION

Computer Science Engineering

Benemérita Universidad Autónoma de Puebla

08/2016 - 05/2021

GPA **9.3** / 10

Pursuing an *Ad Honorem* degree in Computer Science Engineering. Working on thesis about Image Captioning with Reading Comprehension.

ACHIEVEMENTS

Strong research work prior to my degree

At the end of my undergraduate degree I'll have at least ten research papers, published on indexed journals. I am hard working to publish in JCR journals.

Bronze medal at the Oracle Academy Virtual Student Day: Latin America and the Caribbean edition

VOLUNTEERING

Undergraduate Research Assistant

Faculty of Computer Science - BUAP

2020 - Ongoing

- Lead undergraduate research projects.
- Teach basis of machine learning and deep learning.
- Introduce undergraduates to formal research in Mexico.

Introduction to Competitive Programming

Benemérita Universidad Autónoma de Puebla

01/2019 - 2019

Teach and mentor high school students for their competition in the National Informatics Olympiad.

SKILLS

Technical skills

Machine Learning | **Deep Learning** | **Computer Vision** | **Natural Language Processing** | **Research** | **Algorithm Design and Analysis** | **Data Structures** | **Engineering**

VOLUNTEERING

Conference Assistant

Faculty of Computer Science - BUAP

2018 - 2019

- Voluntary support to the XXXII International And XVIII National Conference of the ANIEI.
- Voluntary support to the “Empleate” event at the Faculty of Computer Science of BUAP (2018 and 2019 editions).

RESEARCH PROJECTS

Thesis work: Image Captioning with Reading Comprehension: Towards Machines with Improved Visual Perception and Image Understanding

09/2020 – Ongoing | LKE, Faculty of Computer Science, BUAP

Working with novel deep learning techniques, trying to outperform the state-of-the-art over the TextCaps dataset for OCR-based image captioning. I am also considering some embedded applications, mainly focusing on helping blind people.

Efficient and Mobile Deep Learning Architectures for Fast Identification of Bacterial Strains in Resource-Constrained Devices

01/2021 – Ongoing | LKE, Faculty of Computer Science, BUAP

Fine-tuning state-of-the-art mobile and efficient networks to solve a classification problem with 32 bacterial species (using DIBaS dataset). I am also proposing a new data augmentation strategy. 8 of my 12 architectures exceed 95% of top-1 classification accuracy.

Design space exploration for super-resolution using convolutional autoencoders

08/2020 – Ongoing | Faculty of Computer Science, BUAP

Developing architectures for single image super-resolution. The project is based on convolutional autoencoders. Trying to outperform the standard algorithms such as Lanczos resampling or bilineal/bicubic interpolations.

Approaches to Differential Privacy in Deep Learning Techniques

07/2020 – 10/2020 | Faculty of Computer Science, BUAP

A literature review of the different approaches to implement the Differential Privacy model on deep learning architectures.

Deep Learning for Fast Identification of Bacterial Strains in Resource Constrained Devices

06/2020 – 08/2020 | LKE, Faculty of Computer Science, BUAP

A system for bacterial strains recognition. It is based on MobileNetsv2 and achieved accuracies higher than 90%. This system was developed to be suitable for its implementation on embedded or mobile devices.

Evaluación del modelo neuronal de atención visual en la descripción automática de imágenes en Español

05/2020 – 07/2020 | LKE, Faculty of Computer Science, BUAP

An evaluation of the visual attention model (Show, Attend and Tell paper), in Spanish image captioning tasks.

A grammar-based methodology to detect anomalous events through complex networks in real time

01/2019 – 12/2019 | LKE, Faculty of Computer Science, BUAP

A grammar based anomaly detection in video sequences We proposed an automatic anomaly detection system through language model and complex networks, the system is able to detect anomalies in the textual description of the scenes.

edge2art: Edges to Artworks Translation with Conditional Generative Adversarial Networks

08/2019 – 09/2019 | Puebla de Zaragoza, Mexico

Use of cGANs for image-to-image translation: creating artworks from edges and sketches.

Approaches to EEG-based Brain-Computer Interfaces: A survey

01/2019 – 05/2019 | LKE, Faculty of Computer Science, BUAP

A short survey about the different approaches to brain-computer Interfaces, all with electroencephalography data as source.

Image Reconstruction from Human Brain Activity: A review

01/2018 – 08/2019 | LKE, Faculty of Computer Science, BUAP

A review on several methods to reconstruct mental images. The reviewed methods tried to see what the subject is visualizing in his mind. A good approach to complement BCI and help disabled people.

Facial Recognition using Convolutional Neural Networks and Supervised Few-Shot Learning

03/2018 – 05/2018 | LKE, Faculty of Computer Science, BUAP

Developed a facial recognition system, based on a CNN face detector and a k-nn classifier. The system was trained with 1 to 10 images per subject. The evaluation measures recognition accuracy.

Comparison of Clustering Algorithms in Text Clustering Tasks

05/2018 – 07/2018 | LKE, Faculty of Computer Science, BUAP

A short comparison between Affinity Propagation, k-Means and Spectral Clustering in text clustering, over the PAN dataset.

A review of sentiment analysis techniques: working with Twitter data

08/2017 – 12/2017 | LKE, Faculty of Computer Science, BUAP

This was my first formal research work,I developed this project in the autumn research program of my university. I reviewed the most common techniques for sentiment analysis. Also, I implemented a Bayesian classifier for Twitter data.