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Javier Carnerero Cano

AI Security PhD Researcher

About Me

AI Security PhD Researcher at **Imperial College London**. My current interests are **ML security**, **GANs**, and **federated learning**. I focus on **data poisoning attacks**, where attackers can manipulate training data collected from untrusted sources to degrade the ML algorithm's performance. I have extensive experience in prototyping **ML algorithms** in **Python** and **PyTorch**. I have worked as a **teaching assistant** in several courses in **ML**, **deep learning**, and **probabilistic methods** at **Imperial College London**. I did an internship in summer 2022 at **IBM Research Europe - Ireland** on **ML security**. I was included in the **Santander-CIDOB 35 under 35 List** in 2021. My background is also in **Telecom Engineering**. If you want to know fun facts about me, you can have a look at this **video**.

Work Experience

2018 – pres. **PhD Researcher, Machine Learning Security**, Imperial College London.

2019 – 2022 **Teaching Assistant, Dept. of Computing**, Imperial College London. Courses: **Introduction to ML** (22/23 and 19/20), **Mathematics for ML** (21/22 and 19/20), **Probabilistic Inference** (20/21), **Reinforcement Learning** (20/21), and **Deep Learning** (19/20).

2022 **Research Intern, AI Security and Privacy**, IBM Research Europe - Ireland.

2017 – 2018 **Intern, Data Engineering**, Santander Digital Services Spain.

2016 – 2017 **Research Assistant, RF, Antennas, and Sensors**, Universidad Carlos III de Madrid.

Education

[exp.] 2023 **PhD in Machine Learning Security**, Imperial College London.

2017 **MRes in Multimedia and Communications**, Universidad Carlos III de Madrid.

2017 **MSc in Telecommunications Engineering**, Universidad Carlos III de Madrid.

2015 **BEng in Telecommunications Engineering**, Universidad Carlos III de Madrid.

R&D Interests

- **ML**, **Deep Learning**, and **Adversarial ML**.
- **Data Poisoning**, **Bilevel Optimization**, and **GANs**.
- Federated Learning.

Computer Skills

- **Prog. lang.**: Python, MATLAB, Java, and C.
- **Python ML Frameworks**: PyTorch, NumPy, Scikit-learn, and TensorFlow.
- **Databases**: SQL.

Languages

English **full professional proficiency**

Spanish **native**

Awards and Grants

2022 **Top Talent**, Nova.

2022 **Alumni Excellence Award**, Universidad Carlos III de Madrid.

2021 **35 under 35 List**, Santander-CIDOB: brings together 35 potential minds of 35 or less years of age which are experts on the global digital order, algorithmic governance and AI.

2020 **Best Poster Award**, Machine Learning Summer School Indonesia.

2018 **PhD Scholarship**, Defence Science and Technology Laboratory (Dstl).

2016 **MSc Research Scholarship**, Universidad Carlos III de Madrid.

2014 – 2016 **Tuition-fee Scholarships**, Spanish Ministry of Education.

Selected R&D Projects

2018 – pres. **Evaluating the Robustness of Machine Learning Algorithms in Adversarial Settings**, funded by **Dstl**, in collaboration with **Imperial College London**.

2022 **Machine Unlearning under Data Poisoning**, in collaboration with **IBM Research**.

2017 **Development of a Multiband Feeder with Autotracking Capability**, funded by **Prodetel**, in collaboration with **Universidad Carlos III de Madrid**.

Community Service

Public Engagement

2023 "Defense Against the Dark Arts and Potions: AI Models Can Be Easily Poisoned", **T3chFest**. [**Link**].

2022 **DoC Clock**: video series which features some of the work and an insights into the personality of PhD students in the Dept. of Computing, **Imperial College London**. [**Link**].

Invited Talks

2023 "Machine Learning Models Can Be Easily Poisoned (But Not All Is Lost)", **Universidad Carlos III de Madrid**.

2022 "Machine Learning Models Can Be Easily Poisoned (But Not All Is Lost)", **Universidad Pontificia Comillas**.

Mentoring Assistance

2022 – pres. **PhD Buddy**, **Imperial College London**.

2022 – pres. **Alumni Mentor**, **Universidad Carlos III de Madrid**.

2018 – 2022 Assisted in the **supervision of 2 MSc (one of them awarded "Distinguished" status), 1 MEng, and 1 Undergraduate Research Opportunities Programme (UROP) student research projects, and 1 group project (5 students)** [**Link**] on data poisoning attacks against machine learning, **Imperial College London**.

Peer Review of Conference Papers

AISTATS, *NeurIPS*, *CPSIoTSec at CCS*, *AISec at CCS*, and *MLCS at ECML PKDD*.

Peer Review of Journal Papers

IEEE OJSP, *IEEE TIFS*, and *EURASIP JIS*.

Selected Publications (Full List [**Here**])

Journal Papers

2023 **J. Carnerero-Cano**, *et al.*, "Hyperparameter Learning under Data Poisoning: Analysis of the Influence of Regularization via Multiobjective Bilevel Optimization", under review in *IEEE Transactions on Neural Networks and Learning Systems*. [**Link**].

2018 **J. Carnerero-Cano**, *et al.*, "A Contactless Dielectric Constant Sensing System Based on a Split-Ring Resonator-Loaded Monopole", *IEEE Sensors Journal*, vol. 18, no. 11, pp. 4491–4502. [**Link**].

Conference and Workshop Papers

2021 **J. Carnerero-Cano**, *et al.*, "Regularization Can Help Mitigate Poisoning Attacks... with the Right Hyperparameters", in *ICLR Workshop on Security and Safety in Machine Learning Systems*. [**Link**].

Papers in Preparation

[in prep.] L. Muñoz-González, B. Pfitzner, M. Russo, **J. Carnerero-Cano**, and E. C. Lupu, "Poisoning Attacks with Generative Adversarial Nets", in *arXiv preprint arXiv:1906.07773*. [**Link**].