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Viale Sarca, 336
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PhD Program in Computer Science

Ph.D. talks

24th April 2024
10:30 am
Room "Sala Seminari" - Abacus Building (U14)

Lorenzo Rovida
second-year PhD student working in the field of Fully Homomorphic Encryption and Post-Quantum Cryptography.

Encrypted Image Classification using Fully Homomorphic Encryption

Abstract:
Classifying images has become a straightforward task, thanks to the advent of Deep Neural Networks. Nevertheless, not much attention is given to the privacy concerns associated with sensitive data contained in images.
We propose a solution to this issue by exploring an intersection between Machine Learning and cryptography. In particular, Fully Homomorphic Encryption (FHE) emerges as a promising solution, as it enables computations to be performed on encrypted data. Our solution is an approximate circuit, constructed using FHE primitives, that implements a ResNet20. The obtained accuracy is equal to 91.67% on the CIFAR-10 dataset, which is almost equivalent to the accuracy of the plain model (92.60%).

Francesca Maccarone
first-year PhD student working in the field of neuroimaging.

An fMRI single subject's study with reading impairment – a new paradigm towards personalised medicine

Abstract:
Typically, fMRI studies predominantly rely on group comparisons, often lacking direct applications at an individual subject level, whether for research or clinical purposes.
We aimed to unveil the power of fMRI studies using an fMRI experiment to highlight the brain's area of abnormalities in a 9 years old child experiencing reading impairment.
Three fMRI tasks were used to characterize different reading network sections that were compared to an age matched control group via Crawford-Howell t-test.
The study subject showed a different activation pattern in the right Insula, an area associated with reading comprehension.