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**Grupo de investigación:** RobIRI: Robot Perception and Manipulation at the IRI

**Ubicación del centro:** Instituto de Robótica e Informática Industrial (IRI), Carrer Llorens i Artigas 4-6, 08028, Barcelona

**Título del proyecto:** Unsupervised learning of multimodal word meaning representations

**Descripción del proyecto:** Semantic knowledge provides the foundation for many of our everyday nonverbal behaviors. To crack an egg on a bowl, for example, one must recognize the egg and the bowl, infer their unobserved qualities (the egg is hard-shelled and liquid inside, the bowl is rigid and a container, etc.) and deploy the appropriate action in service of the current goal. All these tasks require semantic knowledge about both the objects and the actions.

To provide robotic systems with the knowledge about objects required to interact with them, this project will address the problem of learning semantic object representations jointly from multiple modalities. The focus will be primarily on the language and vision modalities, that together ensure both semantic relatedness and perceptual grounding to the object representations.

The student is expected to be an Artificial Intelligence enthusiast and have excellent programming skills in Python/PyTorch. He/she will work with Graph Convolutional Neural Networks, which have recently proven to be successful in dealing with graph structured data and are therefore specially suited for modelling semantic representations. Upon reaching the project goals, a scientific publication is expected to be submitted to a major conference or journal.