# Youssef Tamaazousti

*Ph.D. in Deep-Learning & Computer-Vision*

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## Education

2018-curr. **PostDoc (in Food Recognition)**, *MIT CSAIL and QCRI*, Boston and Doha.

2015-2018 **Ph.D. (in Deep-Learning & Computer-Vision)**, *CentraleSupélec (part of University of Paris-Saclay) and CEA LIST*, France.

2012-2015 **Engineering School (in Image & Signal Processing)**, *Institut Supérieur d'Electronique de Paris (ISEP)*, France.

2011-2012 **Bachelor's Degree (in Applied Mathematics)**, *University of Orléans*, France.

2009-2011 **Two-year highly selective classes to prepare for the competitive exams to the "Grandes Ecoles" (Mathematics and Physics)**, *Lycée Pothier*, France.

## Computer & Scientific Skills

**Languages** C/C++, Python, Matlab, JAVA, Bash, LaTeX.

**Softwares** GCC, Make, Visual Studio, Inkscape.

**Libraries** Computer-Vision: OpenCV, VLFeat.

Machine-Learning: Scikit-Learn, LibLINEAR, LibSVM.

Deep Learning: TensorFlow, Caffe, Keras, Basics of PyTorch.

**Computer-Vision** Image recognition (objects, scenes, etc.), Content-Based Image Retrieval, Object Detection (Faster-RCNN, YOLO, RetinaNet, etc.), Multi-Person Pose Estimation and Features Extraction (HOG, SIFT, GIST, BoVW, Fisher Vector, Layers of Neural Networks, etc.), others.

**Machine-Learning** Kernel methods, Logistic regression, Boltzmann Machine, Deep Learning (Multi-Layer Perceptron, Convolutionnal and Recurrent Neural Networks), Transfer-Learning, Domain Adaptation, Dim. reduction, Sparsity, Clustering, others.

**Multimedia** Cross-Modal Retrieval (Image Captioning, Text-Illustration), Textual Embeddings (Word2Vec, RNN, LSTM, GRU), Basics of NLP and Visual Question Answering.

## Languages

**French**: native - **English**: fluent - **Spanish**: basics.

## Publications

### 2018

**TPAMI'18** ***Learning More Universal Representations for Transfer-Learning***.
*(Journal)* *Y.Tamaazousti, H.Le Borgne, C.Hudelot, MEA.Seddik, M.Tamaazousti*
*Submitted*

**Neuro-Computing'18** ***Learning to Map From One Modality to Another Through Non-Semantic Meta-Concepts***.
*(Journal)* *Y.Tamaazousti, H.Le Borgne, I.Chami and C.Hudelot*
*Submitted*

**PATENT** ***Procédé dobtention dapprentissage dun premier réseau de neurones convolutif vers un deuxième réseau de neurones convolutif***.
*(filled)* *Y.Tamaazousti, J.Girard, H.Le Borgne and C.Hudelot*

### 2017

**CVIU'17** ***Vision-Language Integration using Constrained Local Semantic Features***.
*(Journal)* *Y.Tamaazousti, H.Le Borgne, A.Popescu, E.Gadeski, A.Ginsca and C.Hudelot*

**CVPR'17** ***MuCaLe-Net: Multi Categorical-Level Networks to Generate More Discriminating Features***.
*Y.Tamaazousti, H.Le Borgne and C.Hudelot*

**ICMR'17** ***AMECON: Abstract MEta Concept Features for Text-Illustration***.
*(Oral)* *I. Chami*, Y.Tamaazousti*, and H.Le Borgne*
*Both authors contributed equally to this work.

**Traitement-Signal'17** ***Descripteur sémantique local, contraint et basé sur un descripteur RNC diversifié***.
*(Journal)* *Y.Tamaazousti, H.Le Borgne, A.Popescu, E.Gadeski, A.Ginsca and C.Hudelot*

**CICLing'17** ***Supervised Learning of Entity Linking Models by Negative Sample Selection***.
*(Oral)* *H. Daher, R.Besancon, O.Ferret and H.Le Borgne, A-L.Daquo Y.Tamaazousti*

**CORIA'17** ***Désambiguïsation d'entités nommées par apprentissage de modèles d'entités à large échelle***.
*H. Daher, R.Besancon, O.Ferret and H.Le Borgne, A-L.Daquo Y.Tamaazousti*

### 2016

**ICMR'16** ***Diverse Concept-Level Features for Multi-Object Classification***.
*(Oral)* *Y.Tamaazousti, H.Le Borgne and C.Hudelot*

**ICMR'16** ***Constrained Local Enhancement of Semantic Features by Content-Based Sparsity***.
*(Oral)* *Y.Tamaazousti, H.Le Borgne and A.Popescu*

**PATENT** ***Procédé d'obtention d'un système de labellisation d'images***.
*(filled)* *Y.Tamaazousti, H.Le Borgne and C.Hudelot*

**CLEF'16** ***Image annotation and two paths to text illustration***.
*H. Le Borgne, E. Gadeski, I. Chami, T. Tran, Y.Tamaazousti, A. Ginsca, and A. Popescu*

**RFIA'16** ***Agrégation de descripteurs sémantiques locaux contraints par parcimonie basée sur le contenu***.
*(Oral)* *Y.Tamaazousti, H.Le Borgne and A.Popescu*

**RFIA'16** ***Descripteurs à divers niveaux de concepts pour la classification d'images***.
*(Oral)* *Y.Tamaazousti, H.Le Borgne and C.Hudelot*

## Detailed Experience

### Ph.D. Thesis

Sep 2015 - June 2016 **On The Universality of Visual and Multimodal Representations**, *CEA LIST and CentraleSupélec*.

Supervisors Hervé Le Borgne (CEA LIST) and Céline Hudelot (Centrale-Supélec)

Description In this Thesis, we categorize the AI works in two learning-approaches: (i) *Specialization*: learn representations from few specific tasks with the goal to be able to carry out very specific tasks with a very good level of performance; (ii) *Universality*: learn representations from several general tasks with the goal to perform as many tasks as possible in different contexts. While specialization was extensively explored, only a few implicit attempts were made towards universality. Our goal was thus to explicitly address the problem of universality (with deep-learning methods, for image and text data). We have addressed this topic in two different forms: through the implementation of methods to improve universality, and through the establishment of a protocol to quantify universality. For the first point, we proposed three technical contributions: (i) a method to reduce redundancy between the detectors through, an adaptive thresholding and the relations between concepts; (ii) an approach that increases the number of detectors without increasing the amount of annotated data; (iii) a method to preserve the semantics of unimodal representations in multimodal ones. For the second point, we proposed to evaluate universality in a Transfer-learning scheme and proposed new metrics for quantifying universality.

## Teaching

2017 - 2018 **Practical Artificial-Intelligence**, *Centrale-Supélec*.

Description Artificial Intelligence tutorials for Master of Science (M.Sc) students. Rational, Expert and Logical agents; Machine Learning; Basics of NLP; Computer-Vision; Basics of Reinforcement-Learning, Q-learning, etc. [Python, Keras]

2016 - 2018 **Practical Deep-Learning**, *Centrale-Supélec*.

Description Deep Learning tutorials for Master of Science (M.Sc) students. Linear Regression, Multi-Layer Perceptron (MLP), Convolutional Neural Networks (CNN), Recurrent Neural Networks (RNN), Long Short-Term Memory (LSTM), Transfer-Learning, Fine-Tuning, etc. [Python, TensorFlow]

## Master's Thesis

2014 - 2015 **High-Level Layers of CNNs**, *CEA LIST*.

Instructors Hervé Le Borgne (CEA LIST) and Adrian Popescu (CEA LIST)

Description Visual recognition using Convolutionnal Neural Networks (CNNs): (i) applying sparsity on high-level layers of CNNs for image classification and content-based image retrieval; (ii) exploiting deep-learning saliency (Human-gaze detection) for object recognition. [C++, Python, Matlab, Bash, LaTeX]

## Scholar Projects & Internships

2015 **Pedestrian Detection and Recognition**, *ISEP*.

Instructor Florence Rossant (ISEP)

Development of a module of a driving assistance application. The module consisted to detect pedestrians on video-frames obtained from an embedded camera. I developed it using OpenCV and LibSVM libraries. [C++, OpenCV, LibSVM]

2015 **Hand-Written Digit Recognition**, *ISEP*.

Instructor Mathieu Manceny (ISEP)

Development of a hand-written digit recognition system using a shallow neural network that contains multiple hidden-layers. I developed it from scratch, i.e, without any library or framework. [Matlab, from scratch]

2014 **Road Signs Detection and Recognition**, *ISEP*.

Instructor Florence Rossant (ISEP)

Development of a module of a driving assistance application. The module consisted to detect and recognize road signs on video-frames obtained from an embedded camera. I developed it using OpenCV and LibSVM libraries. [C++, OpenCV, LibSVM]

2014 **Implementation of an Intranet (Internship)**, *QATAR FOUNDATION*.

Instructor Badih Touiss (Qatar Foundation)

Design and implementation (from scratch) of an intranet for collaborative working and data storage (in a SQL database). [HTML, CSS, PHP, JAVA, MySQL, others.]