

Detailed research résumé

– Maxime LEFRANÇOIS –

April 25, 2014

Maxime LEFRANÇOIS, 28.
Full-time teaching and research assistant (ATER)
Teaching: IUT Nice Sophia Antipolis
Research: Wimmics team (I3S, CNRS, Inria).

Overview

I have a strongly pluridisciplinary education oriented towards research and teaching:

- Currently:
 - PhD in lexical semantic knowledge representation (defense planned on June 24th 2014);
 - Full-time teaching and research assistant;
- 2010-2013: PhD student in charge of teachings;
- 2010: M2 in computer science;
- 2009: M2 in signal processing;
- 2008: prepared and passed the French Agrégation in mechanics.

Research

My PhD, titled *Lexical Semantics Knowledge Representation for the Meaning Text Theory: Conceptualization, Representation, and Operationalization of Lexicographic Definitions*, is to be defended on June 24th 2014, and led to 10 publications in international conferences.

Chosen publications

- **TOTH'14**: *Méthodologie d'Ingénierie des connaissances pour la représentation des définitions lexicographiques dans le cadre de la théorie Sens-Texte* (international conference, to appear)
- **RANLP'13**: *Rationale, Concepts, and Current Outcome of the Unit Graphs Framework* (international conference)

Teaching and supervision

I taught more than 680H in computer science, mechanics, and other scientific subjects, at different levels:

- 400H in computer science at levels L2, L3, M1, M2;
- 96H in mechanics at levels L1 et L2;
- more than 170H of personal lectures in maths, physics, mechanics.

I co-supervised a 6 months M2 internship, that resulted in two conference publications.

Standardization

I participated in the W3C working group Multilingual Web - LT in 2012;

CURRICULUM VITAE

1/ Civil state

MAXIME LEFRANÇOIS, born on the 04/26/1986 in CAEN, single, no children ; french.

Professional:

Wimmics, Inria Sophia Antipolis - Méditerranée
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Tel : 06 77 95 05 00
Mel : maxime.lefrancois.86@gmail.com

2/ Education and Diploma

- | | | |
|-----------|---|----------------------------------|
| 2010-2014 | PhD student in charge of teaching
Specialized in computer science | UNIVERSITÉ NICE SOPHIA ANTIPOLIS |
| 2011 | Summer School ESSLLI 2011
European Summer School in Logic, Language and Information | Ljubljana, Slovenia |
| 2009-2010 | M2P in computer science
Human-System Communication Engineering
Distinction: first-class honors. | UNIVERSITÉ GRENOBLE 2 |
| 2008-2009 | M2R in signal processing
Signal Image Speech Telecommunications
Distinction: upper second class honors. | INP GRENOBLE & GRENOBLE 1 |
| | M1 in computer science
Human-System Communication Engineering
1 st semester: upper second class honors. | UNIVERSITÉ GRENOBLE 2 |
| 2007–2008 | Preparation to the French agrégation of mechanics
Exam passed in June 2008 (ranked 14 th /25) | ENS CACHAN |
| 2006–2007 | M1 in mechanics
Mechanics and Systems Engineering
Distinction: lower second class honours. | ENS CACHAN |
| 2005–2006 | L3 in mechanics
Distinction: upper second class honors. | ENS CACHAN AND PARIS 6 |
| 2003–2005 | Scientific preparation to competitive entrance exams
for French graduate engineering schools,
Specialized in Physics and Engineering Sciences (PSI) | LYCÉE VICTOR HUGO, CAEN |
| 2003 | Equivalent A-Levels
Specialized in Industrial Sciences, and Mathematics
Distinction: upper second class honors. | LYCÉE JEAN GUÉHENNO, FLERS |

TEACHING

3/ Teaching experiences

I have strong experiences in teaching (more than 680H) in computer science and other scientific fields. I was in charge of some of these courses, and took part in all teaching-related tasks: teaching materials development, lectures, practical works, tutorials, final projects and exams.

- 192H in 2013-2014 in computer science as a full-time teaching and research assistant at IUT Nice Côte d'Azur.
 - Multimedia Web and Semantic Web - in charge
Contact: Full Pr. Nhan Le Thanh.
 - Software Engineering Tools and Models - in charge
Contact: Full Pr. Mireille Blay-Fornarino.
 - Database management systems
Contact: Full Pr. Nhan Le Thanh.
 - Object Oriented Programming
Contact: Associate Pr. Michel Syska.
- 128H in 2011-2012 in computer science as doctoral student at Université Nice Sophia Antipolis.
 - Object Oriented Modeling, UML, OCL
Contact: Full Pr. Philippe Collet
 - Object Oriented Programming
Contact: Associate Pr. Frederic Mallet
 - Advanced Java EE6, EJB, JPA, JSF, CDI Programming
Contact: Associate Pr. Michel Buffa
 - Advanced Web 2.0, HTML5, CSS3, JavaScript Programming
Contact: Associate Pr. Michel Buffa
- three times 24H in 2011-2013 in computer science, at EMSI Marrakesh and Casablanca, Morocco.
 - Advanced Java EE6, EJB, JPA, JSF, CDI Programming - in charge
Contact: Associate Pr. Michel Buffa
- 96H in 2010 in mechanics at Université Joseph Fourier, sport department.
 - Statistics and Informatics - in charge
Contact: Associate Pr. Violaine Cahouet
 - Mechanics of the Sport Movement
Contact: Associate Pr. Franck Quaine
- ~170H as a personal lecturer, various scientific topics.

Chosen lecture material: Multimedia Web and Semantic Web:

http://miageprojet2.unice.fr/User:Max/LPSIL_IDSE_-_Web_Multim%C3%A9dia_%2f%2f_Web_S%C3%A9mantique.

4/ Internship supervision

2013, 5mois **Final M2 project,**

INRIA SOPHIA ANTIPOLIS

Title: Mock-up of a system for interacting with objects of the unit graphs formalisms.

Student: Romain Gugert, UNIVERSITÉ PIERRE ET MARIE CURIE (PARIS 6)

Co-advisor: Alain Giboin, CR

RESEARCH

5/ PhD

a. Context

Title	Lexical Semantics Knowledge Representation for the Meaning Text Theory: Conceptualization, Representation, and Operationalization of Lexicographic Definitions.
Keywords	knowledge representation, lexical semantics, ontologies, web of lexical linked data, rule-based reasoning, Unit Graphs formalism.
Supervision	Fabien GANDON – CR Inria, Inria Sophia Antipolis
Co-Supervision	Christian BOITET – Pr. Université Grenoble 1
Reviewers	Nathalie AUSSENAC-GILLES – DR. Université de Toulouse, IRIT, CNRS Igor BOGUSLAVSKY – Pr. UPM Madrid & Russian Academy of Sciences Marie-Laure MUGNIER – Pr. Université Montpellier 2, LIRMM/Inria
Examiners	Andrea TETTAMANZI – Pr. Université de Nice Sophia Antipolis, I3S/Inria
Defense	planned June 24 th 2014, Sophia Antipolis, FR.

b. Abstract

We lead a knowledge engineering study applied to the linguistic predicates and the lexicographic definitions of the Meaning-Text theory (MTT). We adopt a three-step methodology:

- We first extend the conceptualization of the MTT. We show the necessity to define a deep-semantic level for the representation of meanings. We define deep-semantic units and their actantial structure so that their hierarchical organization corresponds to a hierarchy of meanings. We precise the notion of graph-based formal lexicographic definitions at this level. We present a validation of the extended conceptualization by the MTT lexicographers, thanks to an graph-manipulation application.
- We show that the semantic web formalisms and the conceptual graphs do not suit our need for the representation of the MTT knowledge. We hence develop a new graph-based knowledge representation formalism, called the Unit Graphs formalisms.
- Finally, we led two studies towards the operationalization of the Unit Graphs formalism. We characterized the logical reasoning capabilities of this formalism, and we developed an ontological model for the operationalization on the web of lexical linked data.

6/ Publications & communications

a. International conferences and oral communication

- ⇒ Maxime Lefrançois, Fabien Gandon, and Alain Giboin. Méthodologie d'ingénierie des connaissances pour la représentation des définitions lexicographiques de la théorie Sens-Texte. In *Proc. 8th International Conference Terminology & Ontology : Theories and applications (TOTh'2014)*, Chambéry, 2014
- ⇒ Maxime Lefrançois and Fabien Gandon. The Unit Graphs Framework: A graph-based Knowledge Representation Formalism designed for the Meaning-Text Theory. In *Proceedings of the 6th International Conference on Meaning-Text Theory (MTT'2013)*, Prague, Czech Republic, 2013
- ⇒ Maxime Lefrançois, Romain Gugert, Fabien Gandon, and Alain Giboin. Application of the Unit Graphs Framework to Lexicographic Definitions in the RELIEF project. In *Proceedings of the 6th International Conference on Meaning-Text Theory (MTT'2013)*, Prague, Czech Republic, 2013

- ⇒ Maxime Lefrançois and Fabien Gandon. Reasoning with Dependency Structures and Lexicographic Definitions using Unit Graphs. In *Proc. of the 2nd International Conference on Dependency Linguistics (Depling'2013)*, Prague, Czech Republic, 2013. ACL Anthology
- ⇒ Maxime Lefrançois and Fabien Gandon. ILexicOn: Toward an ECD-Compliant Interlingual Lexical Ontology Described with Semantic Web Formalisms. In Igor Boguslavsky and Leo Wanner, editors, *Proceedings of the 5th International Conference on Meaning-Text Theory (MTT'2011)*, pages 155–164, Barcelona, Spain, 2011. INALCO

b. International conferences and poster communication

- ⇒ Maxime Lefrançois and Fabien Gandon. Rationale, Concepts, and Current Outcome of the Unit Graphs Framework. In *Proceedings of the 9th International Conference on Recent Advances in Natural Language Processing (RANLP 2013)*, pages 382–388, July 2013
- ⇒ Maxime Lefrançois and Fabien Gandon. The Unit Graphs Framework: Foundational Concepts and Semantic Consequence. In *Proceedings of the 9th International Conference on Recent Advances in Natural Language Processing (RANLP 2013)*, Hissar, Bulgaria, 2013. ACL Anthology
- ⇒ Maxime Lefrançois and Fabien Gandon. ULiS: An Expert System on Linguistics to Support Multilingual Management of Interlingual Knowledge bases. In Kyo Kageura and Pierre Zweigenbaum, editors, *Proc. of the 9th International Conference on Terminology and Artificial Intelligence ({TIA} 2011)*, pages 108–114, Paris, France, 2011. INALCO

c. National conferences

- ⇒ Maxime Lefrançois, Fabien Gandon, Alain Giboin, and Romain Gugert. Un éditeur de définitions formelles pour les connaissances lexicales de la théorie Sens-Texte. In *Proc. 25e Journées Franco-phones d'Ingénierie des Connaissances (IC'2014)*, Clermont Ferrand, France, 2014
- ⇒ Maxime Lefrançois. Représentation des connaissances du DEC: Concepts fondamentaux du formalisme des Graphes d'Unités. In *Actes de la 15ème Rencontre des Étudiants Chercheurs en Informatique pour le Traitement Automatique des Langues (RECITAL'2013)*, pages 164–177, Les Sables d'Olonne, France, 2013

d. International workshops, oral communication

- ⇒ Maxime Lefrançois and Fabien Gandon. ULiS: An Expert System on Linguistics to Support Multilingual Management of Interlingual Semantic Web Knowledge bases. In Paul Buitelaar Elena Montiel-Ponsoda John McCrae and Philipp Cimiano, editors, *Proc. 2nd Workshop on the Multilingual Semantic Web, collocated with ISWC (MSW'2011)*, volume 775, pages 50–61, Paris, France, 2011. CEUR-WS

e. Research report

- ⇒ Maxime Lefrançois and Fabien Gandon. The Unit Graphs Mathematical Framework. Research Report RR-8212, Inria, 2013

f. Oral communications without proceedings

- ⇒ Représentation des connaissances sémantiques lexicales de la Théorie Sens-Texte : Conceptualisation; représentation; et opérationnalisation des définitions lexicographiques. TALEP team Seminar, LIF/CNRS, May 22 2014, Marseille, France.
- ⇒ Representation of Linguistic Predicates and Formal Lexicographic Definitions with the Unit Graphs KR Formalism. GraphIk team Seminar, LIRMM/Inria/CNRS/INRA, December 13 2013, Montpellier, France.
- ⇒ Formalisme des Graphes d'Unités, vers la Représentation des Connaissances Linguistiques du DEC. 3^{ième} Journée RELIEF, 13 juin 2013, Nancy, France.
- ⇒ MLW-LT, the Semantic Web, and Linked Open Data. *W3C Workshop: The Multilingual Web -- Linked Open Data and MultilingualWeb-LT Requirements*, 11–13 June 2012, Dublin, Ireland.

7/ Standardization activity

Participation to the **Multilingual-Web-LT W3C Working Group** until Oct. 2012 charter revision.
 ⇒ Maxime Lefrançois. MLW-LT, the Semantic Web, and Linked Open Data. *W3C Workshop: The Multilingual Web – Linked Open Data and MultilingualWeb-LT Requirements*, 11–13 June 2012, Dublin, Ireland.

8/ Previous research experiences

- 2010, 4 months **M2 – Internship in computer science** INRIA GRENOBLE
 Title : Ontology Alignment Evolution
 Keywords: Ontology evolution, ontology alignment, ontology versioning, belief revision.
 Team: EXMO Team, Inria Grenoble - Rhône-Alpes
 Advisors: Jérôme Euzenat, DR, and Jérôme David, MC.
- 2010, 3 months **M2 – Software engineering project** GRENOBLE 2
 Title : An interactive web environment for direct manipulation of mathematical objects
 Place: service TICE-EAD, Université Pierre Mendès France (Grenoble 2)
 Technologies: Java EE and Google Web Toolkit
 Advisors: Mohammed El Methni, MC.
- 2009, 5 months **M2 – Internship in signal processing and biomechanics** LIG GRENOBLE
 Title : Robust identification of numerous hand gesture for muscle-machine interaction
 Keywords: surface electromyography, muscle-computer interaction, blind source separation, independent component analysis, continuous classification, sources localization
 Place: GETALP team, Laboratoire d’Informatique de Grenoble
 Link with computer science: HCI programming with Matlab.
 Advisors: Christian Jutten, PU, and Franck Quaine, MC.
- 2007, 4 months **M1 – Numerical methods internship** TU DELFT, NL
 Title : Implementation of the FETI-DP Method in the OOFELIE Code
 Place: Precision and Microsystems Engineering Team, TU DELFT
 Technologies: C++,
 Advisors: Pierre Gosselet, CR, and Daniel Rixen, prof.dr.

9/ Associations

- 2013** member of the *Association pour le Traitement Automatique des Langues* (ATALA)
2012 member of the *Association pour le Traitement Automatique des Langues* (ATALA)
 member of the *Association Française pour l’Intelligence Artificielle* (AFIA)