INTRODUCTION

MASTER 1 ICE, 2017-2018

Available at https://combemale.github.io/teaching/m1ice/

BENOIT COMBEMALE
PROFESSOR, UNIV. TOULOUSE, FRANCE

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@BCOMBEMALE

Short Resume

- Positions
  - Since 2017 Full Professor in Software Engineering, University of Toulouse - Jean Jaurès

    Teacher in the Department of Mathematics and Computer Science

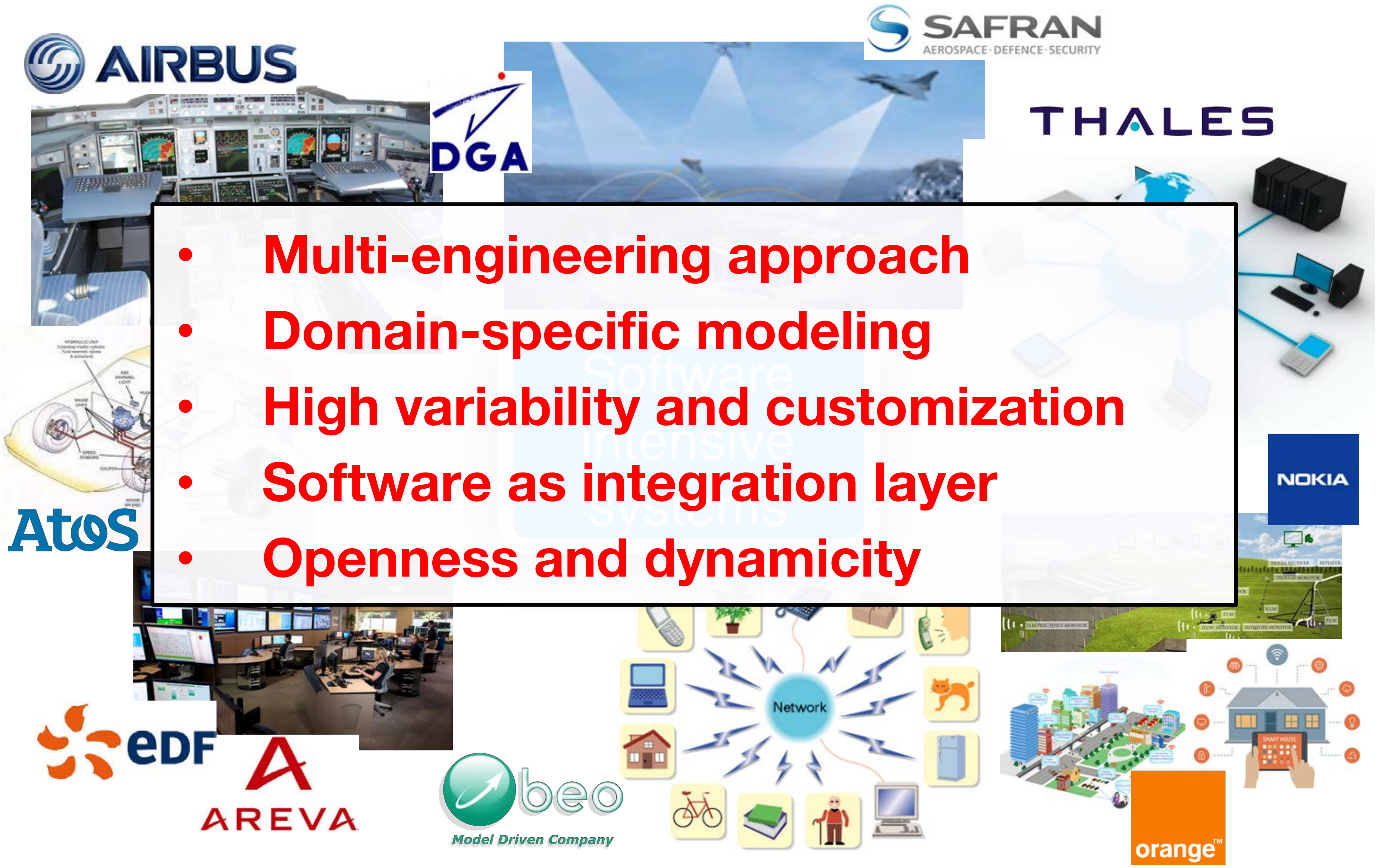
    Researcher in the MACAO group of the CNRS/IRIT lab
  - 2009 - 2017 Associate Professor in Software Engineering, University of Rennes 1

    Teacher in the engineering school ESIR (+ Master in SE)

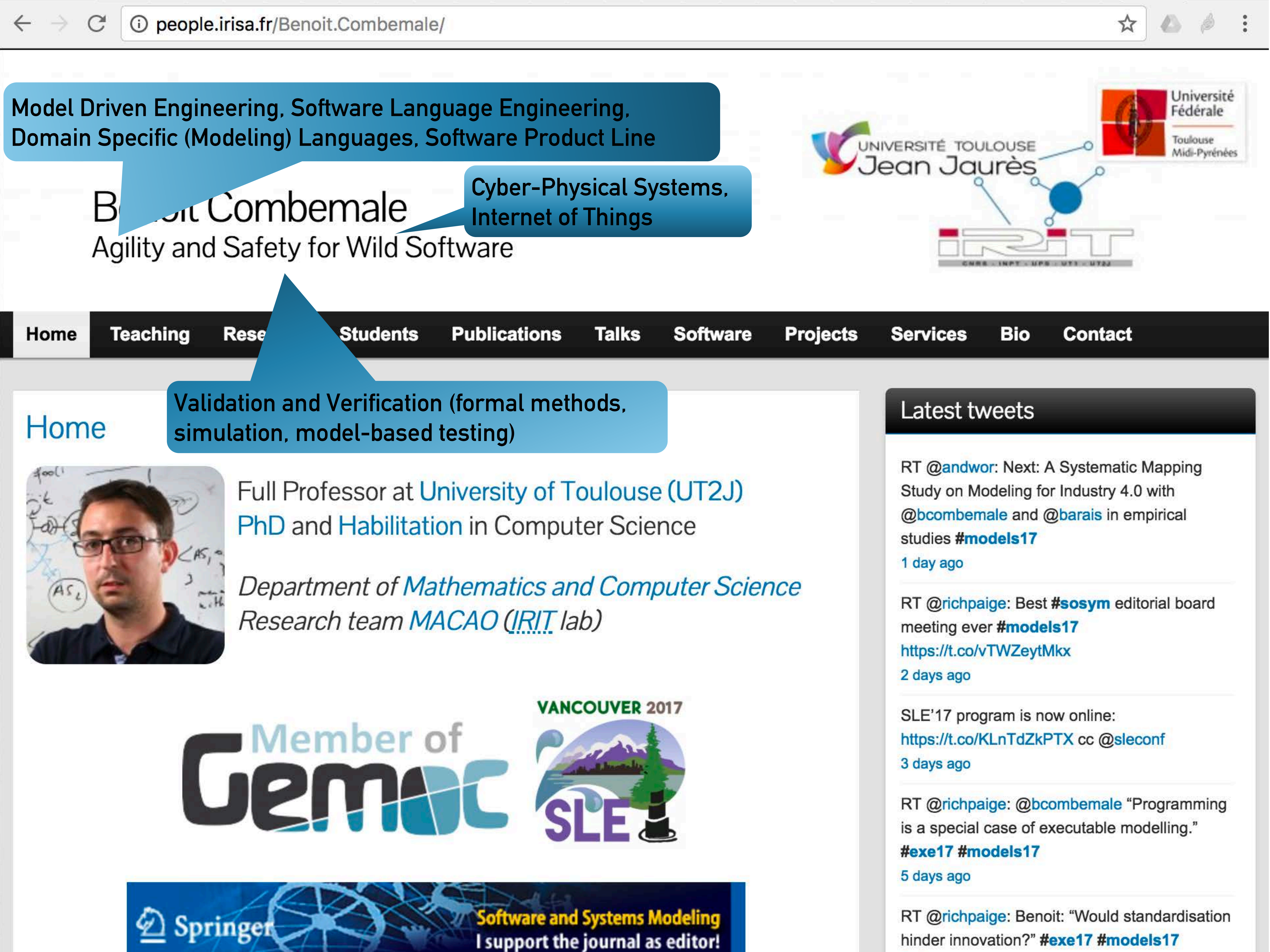
    Researcher in the DiverSE group, joint to CNRS/IRISA and Inria
    - 2017 Visiting Professor at McGill University, CA
    - 2013-2016 Research Scientist at Inria *(on leave from UR1)*
    - 2010-2015 Regular visiting professor at CSU, USA
  - 2008-2009 Postdoc fellow, Inria
  - 2005-2008 Research associate (PhD student) at ENSEEIHT (grant, French government)

- Education
  - 2015 HDR in Computer Science, University of Rennes 1
  - 2008 PhD in Computer Science, University of Toulouse
  - 2005 MSc in Computer Science, ENSEEIHT, Toulouse
  - 2004 IUP NTIE, UT2J, Toulouse (software engineer at INEO SCLE)
  - 2002 IUT in Computer Science, UT2J (Blagnac), Toulouse

Background: Complex Software-Intensive Systems



- Multi-engineering approach
- Domain-specific modeling
- High variability and customization
- Software as integration layer
- Openness and dynamicity



Model Driven Engineering, Software Language Engineering, Domain Specific (Modeling) Languages, Software Product Line

Cyber-Physical Systems, Internet of Things

Validation and Verification (formal methods, simulation, model-based testing)

people.irisa.fr/Benoit.Combemale/

Benoit Combemale

Agility and Safety for Wild Software

Université Toulouse Jean Jaurès

Université Fédérale Toulouse Midi-Pyrénées

IRIT

CNRS - INPT - UPS - UT1 - UT2J

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Home

Full Professor at University of Toulouse (UT2J)

PhD and Habilitation in Computer Science

Department of Mathematics and Computer Science

Research team MACAO (IRIT lab)

Member of Gemoc

VANCOUVER 2017 SLE

Springer Software and Systems Modeling I support the journal as editor!

Latest tweets

RT @andwor: Next: A Systematic Mapping Study on Modeling for Industry 4.0 with @bcombemale and @barais in empirical studies **#models17**

1 day ago

RT @richpaige: Best **#sosym** editorial board meeting ever **#models17** https://t.co/vTWZeytMkx

2 days ago

SLE'17 program is now online: https://t.co/KLnTdZkPTX cc @sleconf

3 days ago

RT @richpaige: @bcombemale "Programming is a special case of executable modelling." **#exe17** **#models17**

5 days ago

RT @richpaige: Benoit: "Would standardisation hinder innovation?" **#exe17** **#models17**

Hack your own languages?

Join us in the MDE/SLE group of the CNRS IRIT lab, in a freshly rebuilt campus of the warm and vibrant city of Toulouse!

Open Positions
for MS, PhD and Postdoc

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IRIT
CNRS - INPT - UPS - UT1 - UT2J

WE WANT YOU!

Round table

background? business project? expectations for the future? …

Vous maîtrisez la programmation…

… oriéntée objet !

Software Engineering: Definition

The production of **operational software** satisfying **defined standards of quality…**

… includes programming, but is **more than programming!**

The five components of Software Engineering [Meyer]:

- **Describe**: requirements, design, specification, doc...
- **Implement**: programming
- **Assess**: testing and other V&V techniques
- **Manage**: plans, schedules, communication, reviews
- **Operate**: deployment, installation...

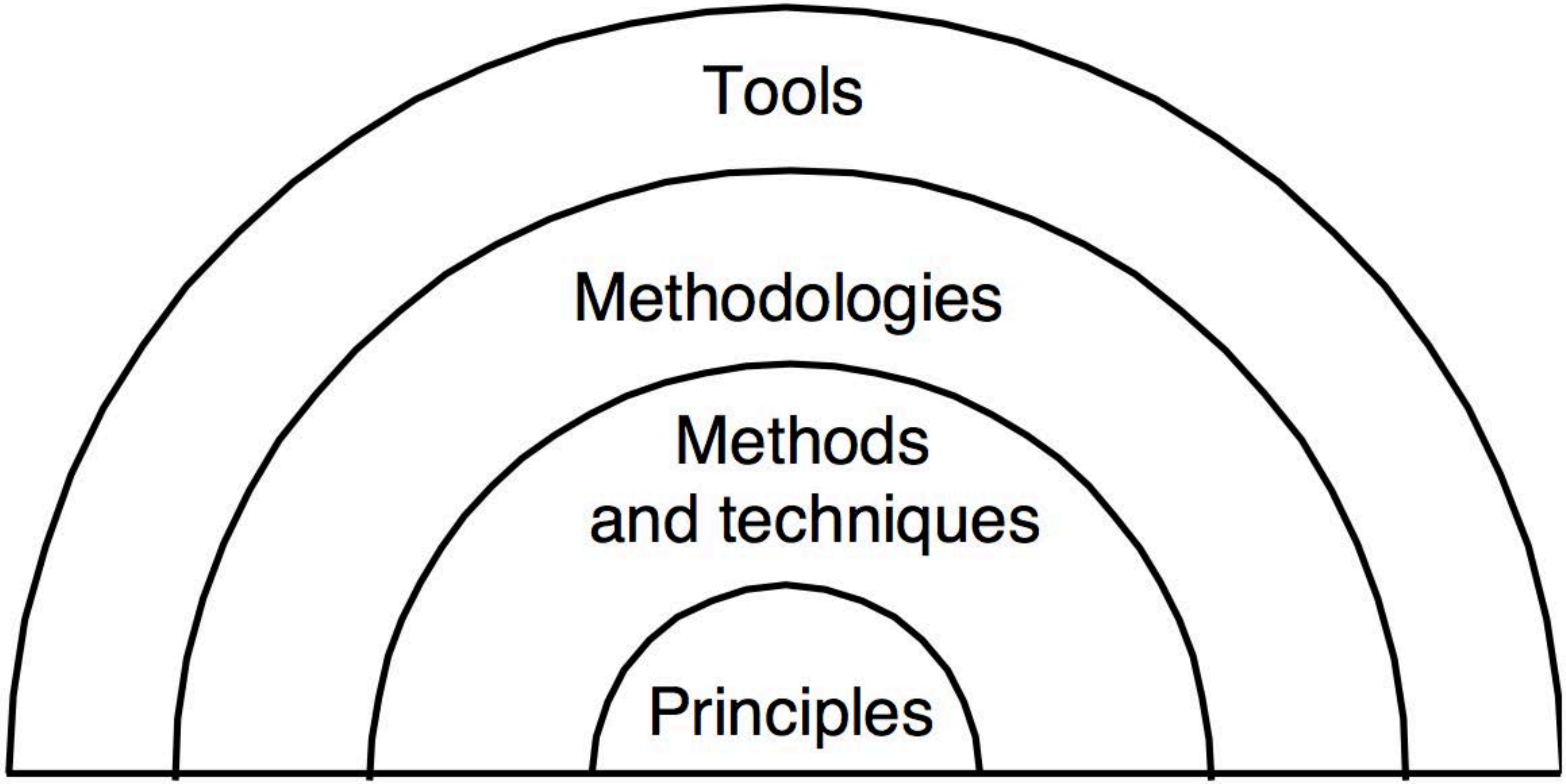
Software Engineering: Definition

- is a <u>profession</u> dedicated to designing, implementing, and modifying software so that it is of higher quality, more affordable, maintainable, and faster to build.

- is a <u>systematic approach</u> to the analysis, design, assessment, implementation, test, maintenance and re-engineering of a software by applying engineering to the software.

- first appeared in the 1968 NATO Software Engineering Conference (to provoke thought regarding the perceived "software crisis" at the time).

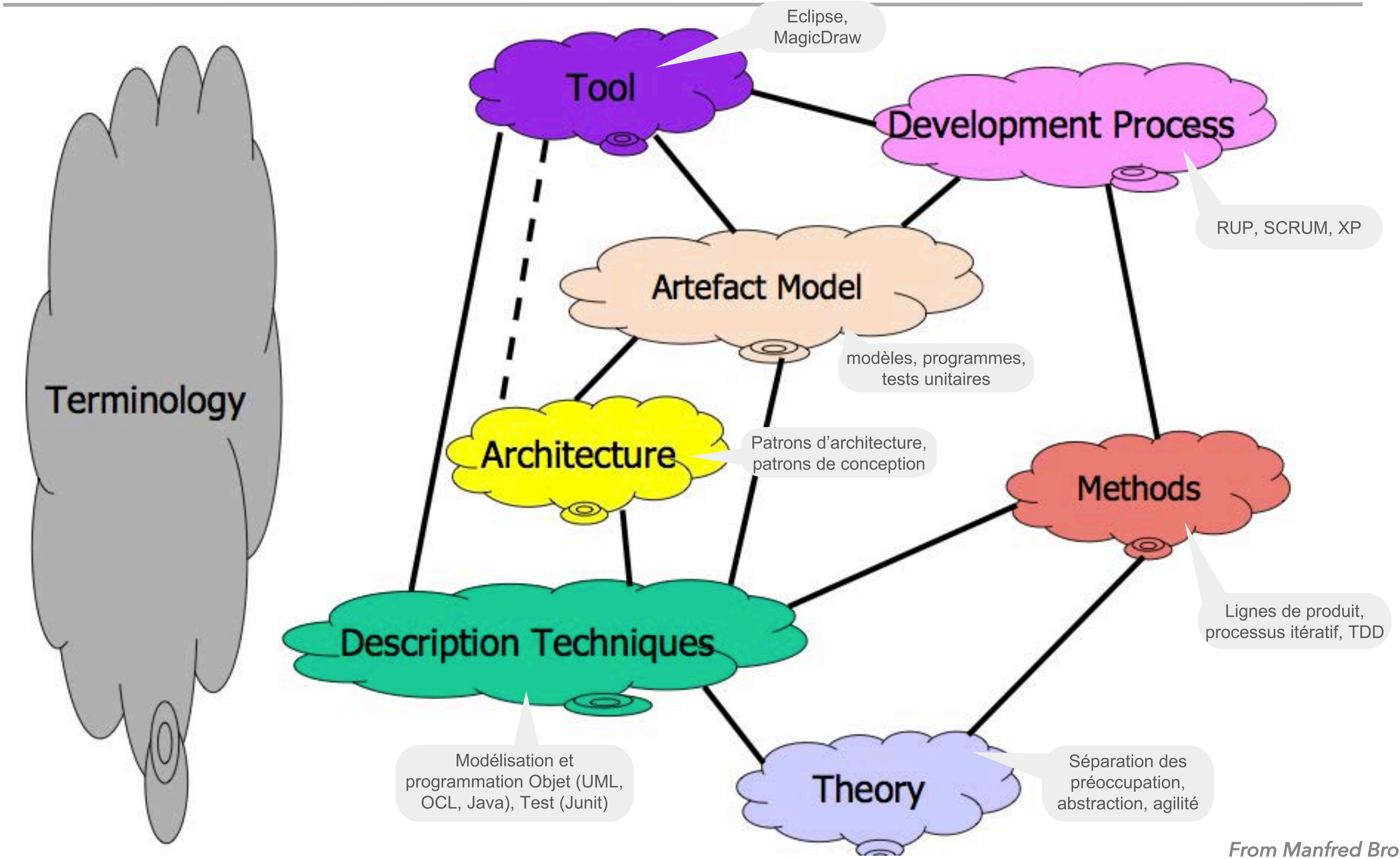
Software Engineering: Basics



Carlo Ghezzi, Mehdi Jazayeri, and Dino Mandrioli.

Fundamentals of Software Engineering, 2nd edition. 2002.

Software Engineering: Basics



Eclipse, MagicDraw

RUP, SCRUM, XP

modèles, programmes, tests unitaires

Patrons d'architecture, patrons de conception

Lignes de produit, processus itératif, TDD

Modélisation et programmation Objet (UML, OCL, Java), Test (Junit)

Séparation des préoccupation, abstraction, agilité

From Manfred Broy
The Future of Software Engineering Symposium
22-23 November 2010, ETH Zurich

Our Courses: A Long Path Together ☺

- **Master 1 ICE**
  - Génie Logiciel (GL):
    - GLa: Validation & Vérification P1
    - *GLb - Processus de développement collaboratifs*
    - *GLc – Développement orienté test et refactoring*
    - *GLd - Qualité logicielle*
    - *GLe – Maintenance, Gestion du changement*
  - Environnement Collaboratif (EC):
    - ECa: Méthodes de développement P1
    - ECb: Ingénierie des systèmes P1/P2
    - ECc: DevOps P1
    - *ECd - Maîtrise des licences d'un produit logiciel*
  - Ingénierie Dirigée par les Modèles (IDM) P2/P3
  - Projet de développement collaboratif (PDC) P3/P4/P5

- **Master 2 ICE**
  - Projet collaboratif tuteuré (PCT) P2/P3/P4

Course Organization

- Bookmark the **course website**
  - **https://combemale.github.io**
- You all need a **Github** account:
  - **https://github.com/selabs-ut2j**
  - (optional) Student pack: https://education.github.com/pack
  - We will (maybe) use: https://classroom.github.com
  - BTW, recommended: https://github.com/buunguyen/octotree
- You all need to join SE Labs on **Slack**:
  - **Workspace: https://se-labs.slack.com**
  - **Invit: http://bit.ly/2fZoMiO**

Course Organization

- Lectures, tutorials and labs have to be interactive
- Lectures, tutorials and labs are all mandatory
- Laptops (and others mobile devices) are useless during lectures => prohibited
- Disclaimers:
  - my slides are a mix of French and English
  - my slides are usually just in time published, i.e. by the day/hour of the lectures (and might be outdated before)
  - You must use your preferred IDE (and I have a very limited knowledge on most of them)

BTW, I'm not your type checker, compiler, javadoc, stackoverflow, google…

Teach yourself, and work with others…

How to reach me

- Preferably at the **end of a lectures/tuto/labs**
- Or on **Slack** (use the right channel)
- Ultimately, by sending an **email** (`benoit.combemale@irit.fr`) with:
  - Your **academic email** (or a comprehensible one)
  - An **explicit object** starting with "[ICE1-XX] …", where XX is the course related to the email
  - A **full signature** including your name, group/partners, etc.
  - A **comprehensible description** of your issues
  - The **related files** (diagrams, source code…)
    - Rq: to export an Eclipse project, use the dedicated facility (Project's contextual menu (by right clicking) > export > Archive File…)

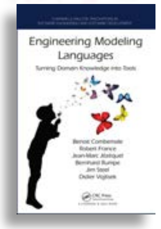
compliance_with_these_rules => a_guaranteed_response

Course Materials

- Slides of the courses
- Complementary materials on the course website
  - https://combemale.github.io
- Textbooks and books (see slides), incl.:

INGÉNIERIE DIRIGÉE par les MODÈLES
Des concepts à la pratique

Ingénierie Dirigée par les Modèles : des concepts à la pratique, by Jean-Marc Jézéquel, Benoit Combemale, Didier Vojtisek, Références sciences, ellipses (Eds.). 2012.



Engineering Modeling Languages: Turning Domain Knowledge into Tools, by Benoit Combemale, Robert B. France, Jean-Marc Jézéquel, Bernhard Rumpe, Jim R.H. Steel, and Didier Vojtisek. Chapman and Hall/CRC, pp.398, 2016. Companion website: http://mdebook.irisa.fr

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  - https://www.cybrhome.com/topic/engineering-blogs-of-companies