Software Development in Science

19/20 November 2019 | Guido Trensch, Wouter Klijn (JSC, SimLab Neuroscience)

MOTIVATION

Motivation

- Scientific **research** increasingly **relies on software**.
- To get a **reliable outcome** formalized processes are required, especially when developing software in teams.
- Thus, formal education and training in **software development methodologies** become more important.
- "***Agile methods***" is the (new) paradigm.
- **Software Engineering** plays a key role in the production of software.

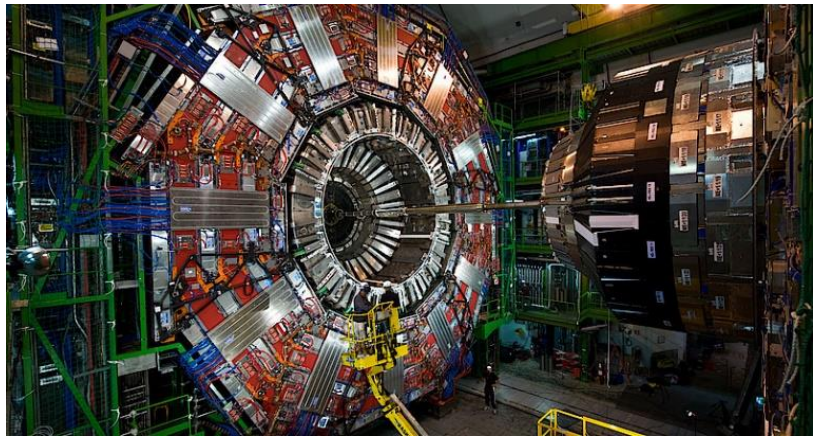
Scientific research has yet to absorb knowledge of these methodologies from fields in which they are common practice.

A VERY BRIEF INTRODUCTION TO SOFTWARE ENGINEERING

Introduction to Software Engineering

Software can be as complex as human brains can design.

Apply engineering methods to the production of software.



CMS, LHC Cern

„Software engineering is managing the complexity in software development.“

Introduction to Software Engineering

Software engineering body of knowledge: **15 Knowledge Areas** and **7 Related Disciplines**.

Knowledge Areas		Related Disiplines
• Software Requirements • Software Design • Software Construction • Software Testing • Software Maintenance • Software Configuration Management • Software Engineering Management • Software Engineering Process	• Software Engineering Models and Methods • Software Quality • Software Engineering Professional Practice • Software Engineering Economics • Computing Foundations • Mathematical Foundations • Engineering Foundations	• Computer Engineering • Computer Science • General Management • Mathematics • Project Management • Quality Management • Systems Engineering

SWEBOK®

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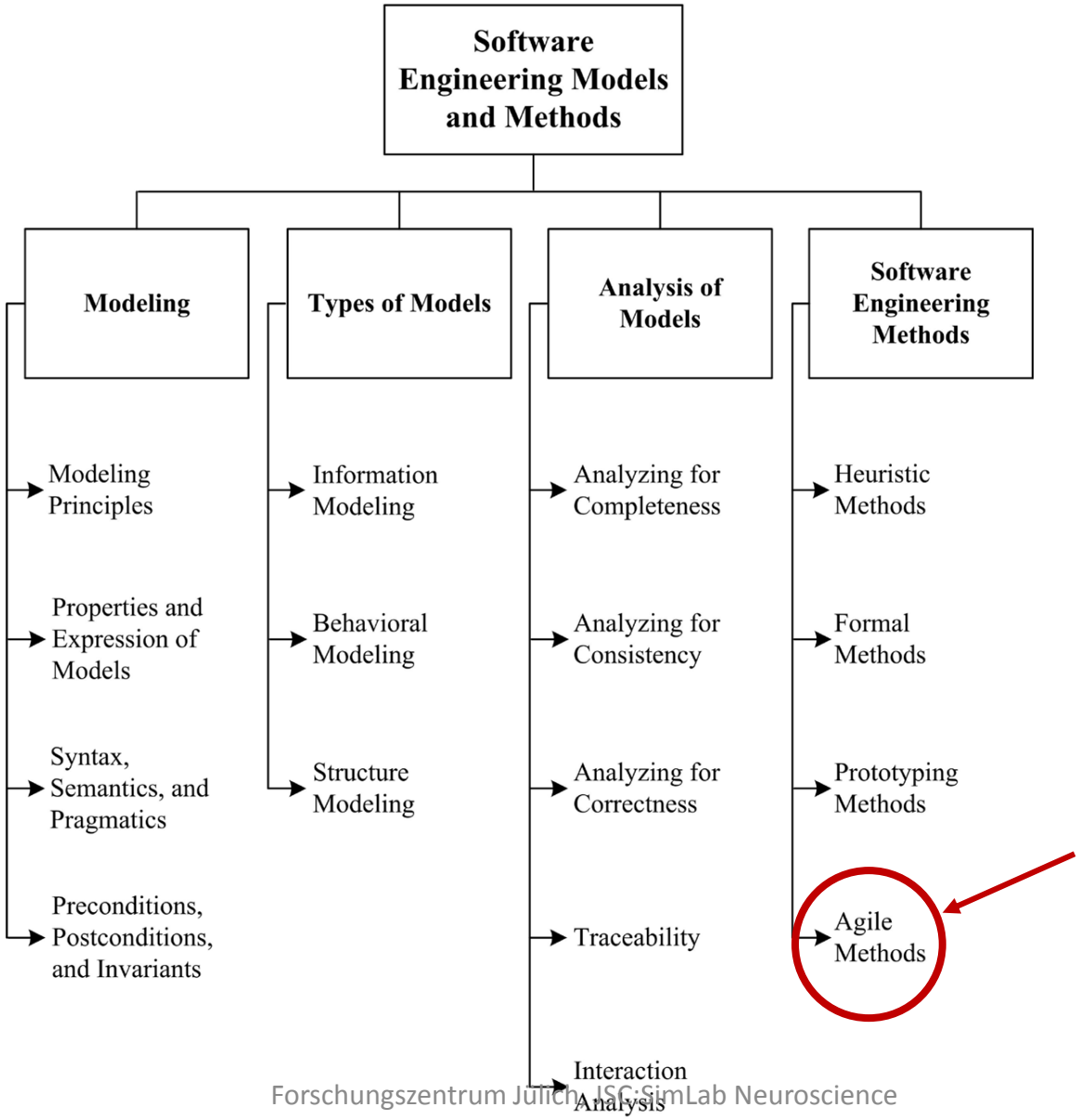
Introduction to Software Engineering



e.g., Scrum or Kanban

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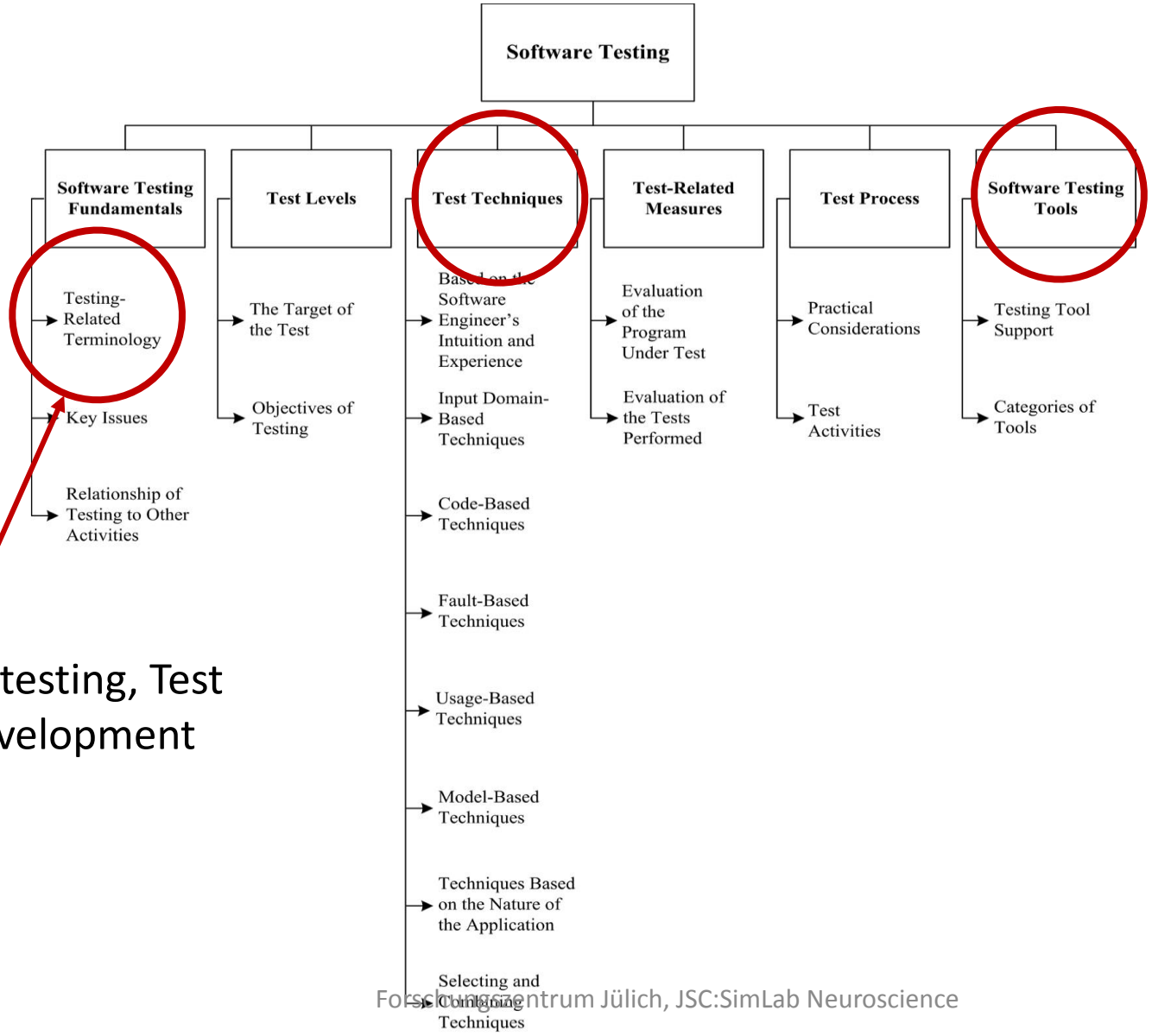
Introduction to Software Engineering



e.g., Unit testing, Test driven development (TD)

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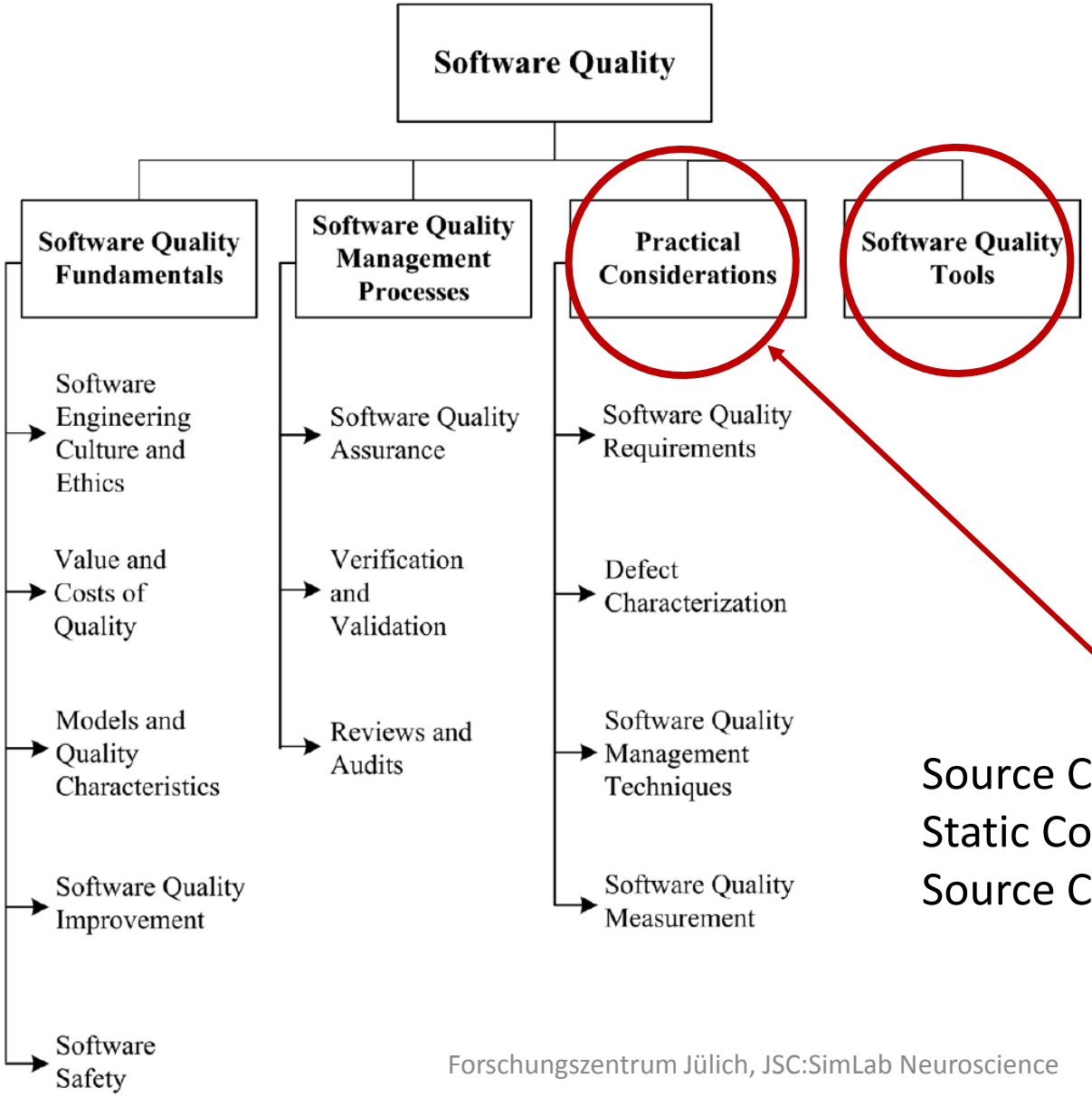
Introduction to Software Engineering



Source Code Quality, Clean Code, Static Code Analysis Tools and Source Code Formatting

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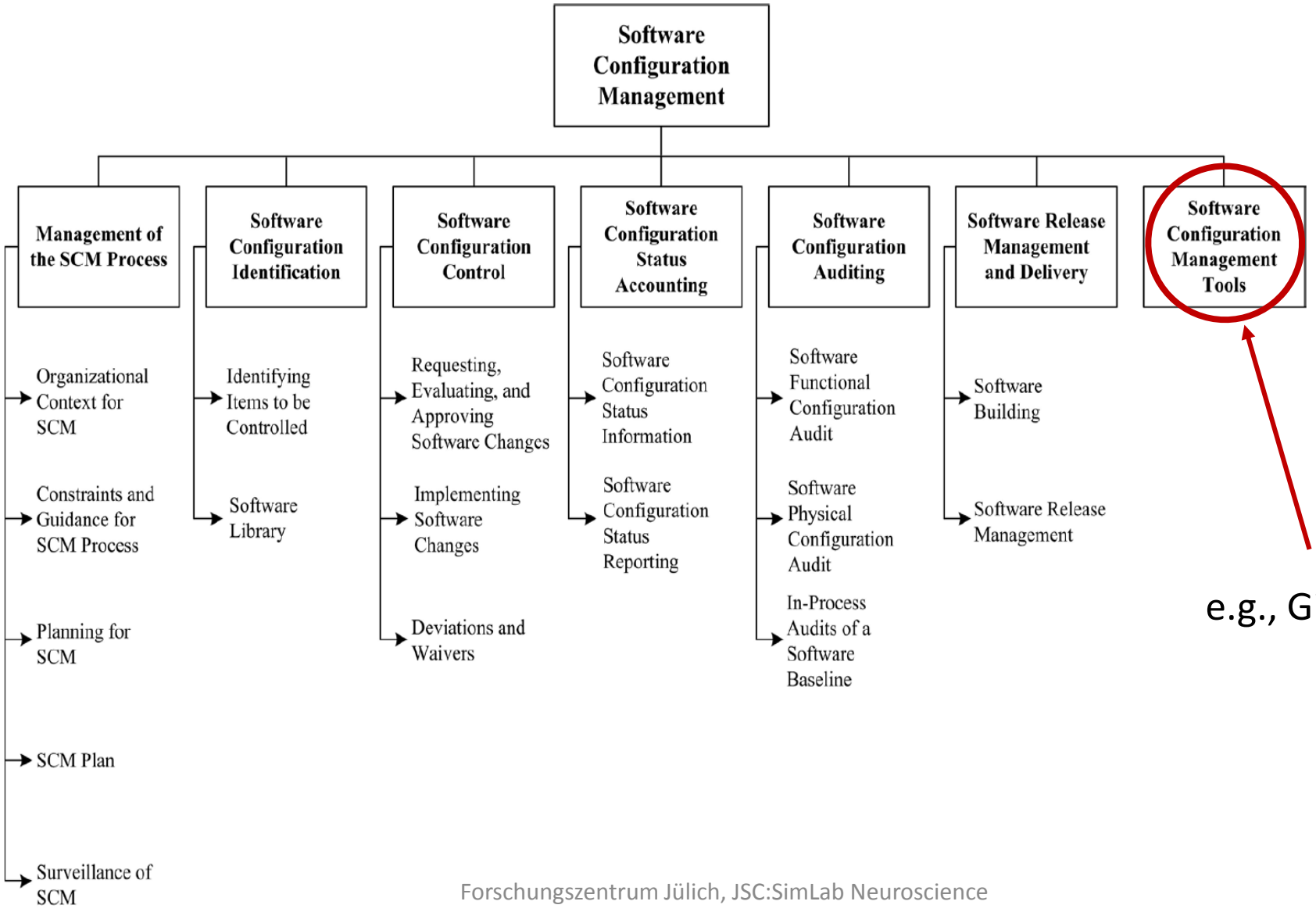
Introduction to Software Engineering



e.g., Git, GitHub, GitLab

References

The possibly most comprehensive book.

http://iansommerville.com/software-engineering-book/