

## GUIDE FOR THE MVA MASTER INTERNSHIP

### To the attention of host organizations

The internship must be a research internship and may take place in an academic laboratory or in a company, in France or abroad.

It must receive academic approval from the master's administration before any contractualization.

It is essential to ensure that internship proposals comply with the MVA criteria, which require the internship to involve a real scientific research challenge and contribute to the development of one of the themes taught in the master.

#### Duration of the internship

The minimum duration is four months.

The internship may begin as soon as courses end, in early April.

#### Objectives of the internship

The pedagogical and scientific objective of MVA internships is to give master students the opportunity to deepen the concepts taught in the program and to put them into practice.

The expected and assessed skills of students are:

- Formalizing the research problem to be addressed,
- Identifying the relevant literature and techniques from the MVA domains,
- Determining which tools, code libraries, and existing methodologies to rely on,
- Developing one or more models, mathematical formulations, algorithms, analytical methods,
- Carrying out the necessary mathematical analyses and implementing the aforementioned models, methods, and algorithms,
- Conducting tests and numerical experiments to assess the proposed methods, characterize their strengths and weaknesses, and estimate their performance levels, including in comparison to baseline or state-of-the-art methods,
- Writing a clear and precise report on the research conducted.

#### Details on what is not taken into account for the evaluation of the internship

Warning: Tasks involving data collection and preprocessing on one hand, and production deployment of algorithms on the other, will not be considered in the internship evaluation and should therefore not constitute a significant portion of the intern's work. Likewise, routine application of standard methods or

simple comparison/implementation of off-the-shelf methods does not validate an MVA internship and cannot be its main objective.



Thus all tasks related to data collection, cleaning, and storage must be handled beforehand by the company or laboratory.

Students are therefore encouraged to discuss precisely the problem(s) and objectives of the internship with their supervisor(s) and ensure that the data required for the internship work are fully available from the beginning of the internship.

Academic and industrial partners of the master are likewise encouraged to define clearly, before the start of the internship, the objective and scientific problem, identify relevant literature, and if necessary conduct preliminary studies in other contexts (possibly other internships) than the MVA internship.

## Administrative steps before the internship

The student must complete the internship form for academic approval and have it signed by the internship supervisor in the host organization and the academic advisor (chosen among the master's instructors).

The detailed internship topic must be attached in pdf format, following the detailed template:

1. TITLE OF THE INTERNSHIP TOPIC
2. INTERNSHIP CONTEXT (location, scientific environment, academic and/or industrial domain)
3. INTERNSHIP PROBLEM STATEMENT (which scientific question is being addressed? what are the stakes? what data will be used?)
4. STATE-OF-THE-ART ANALYSIS (what existing methods address this problem? what are their limitations? – this description must include references)
5. SCIENTIFIC PROPOSAL FOR THE INTERNSHIP (which scientific directions will be explored? how is this approach innovative compared to existing work? – this description must include references)
6. EXPECTED RESULTS (what kind of results are expected? how will they be evaluated?)
7. LINKS WITH MVA COURSES
8. BIBLIOGRAPHY (at least 5 references)

After academic approval of these elements by the Master's administration, contractualization may proceed (internship agreement, etc.)

## After the internship

The student must organize a defense with at least their supervisor in the host organization and their academic advisor (who must receive the most complete possible version of the internship report one week before).

After the defense, the evaluation form is completed by the supervisor and the academic advisor. It will then be submitted together with the final report on the master's platform for the jury.