# Internship Program for International Students

## Internship Subject Form

<table>
<thead>
<tr>
<th>Name of the Host Laboratory</th>
<th>Laboratoire d'Informatique de l'Ecole Polytechnique (LIX)</th>
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</thead>
<tbody>
<tr>
<td>Website of the Host Laboratory</td>
<td><a href="https://www.lix.polytechnique.fr/">https://www.lix.polytechnique.fr/</a></td>
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<tr>
<td>Research Group</td>
<td>Algorithms and Complexity</td>
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<tr>
<td>Internship Supervisor</td>
<td>Benjamin Doerr</td>
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<tr>
<td>Internship Subject</td>
<td>Runtime Analysis of Randomized Search Heuristics</td>
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</tbody>
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### Student's level
- [ ] Advanced Undergraduate Students (3rd or 4th year)
- [x] Master's students (1st or 2nd year)
- [ ] PhD students

### Proposed Duration
- [x] 3 months
- [ ] 4 months
- [ ] 5 months
- [ ] 6 months

### Prerequisites
Experience in the design and analysis of algorithms, ideally randomized algorithms, but classic algorithms is fine as well. Excellent maths skills. Excellent English.

### Internship description (max. 15 lines)
The analysis of randomized search heuristics such as genetic algorithms, ant colony optimizers, or estimation-of-distribution algorithms has greatly increased our understanding of these methods. In this research-oriented internship addressed to PhD students with a strong theoretical/mathematical background, we will work on a particular problem of current interest in this domain. The precise topic will be discussed with the intern. Topics we have been successfully conducted research in include analyses how randomized search heuristics cope with local optima, how self-adjusting parameter choices can improve the performance of genetic algorithms, and how estimation-of-distribution algorithms can avoid being trapped by genetic drift. The target for this internship is to lay the foundations for a scientific paper to be submitted to an international conference.

The boxes marked with cross implies eligible