# Internship Program for International Students

## Internship Subject Form

<table>
<thead>
<tr>
<th>Name of the Host Laboratory</th>
<th>LIx, Ecole Polytechnique</th>
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<tbody>
<tr>
<td>Website of the Host Laboratory</td>
<td><a href="https://www.epizeuxis.net">https://www.epizeuxis.net</a></td>
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<tr>
<td>Research Group</td>
<td>Epizeuxis Network Research Group</td>
</tr>
<tr>
<td>Internship Supervisor</td>
<td>Jiazi Yi, <a href="mailto:jiazi.yi@polytechnique.edu">jiazi.yi@polytechnique.edu</a></td>
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<tr>
<td>Internship Subject</td>
<td>A study of Low-Power Wide-Area Networks (LPWAN)</td>
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### Student’s level
- ☑ Advanced Undergraduate Students (3rd or 4th year)
- ☑ Master’s students (1st or 2nd year)
- ☐ PhD students

### Proposed Duration
- ☑ 3 months
- ☑ 4 months
- ☑ 5 months
- ☑ 6 months

### Prerequisites
Major in computer science, network engineering, communication, electrical engineering or related fields.
Good understanding and experiences in communication/network protocols, network simulation, programming (especially C/C++, Python, Java).

### Internship description (max. 15 lines)
Low-Power Wide-Area Networks (LPWANs) are networks connecting resource-constrained (low-power) devices over a wide area (with links up to several km long) with low-bandwidth connectivity, and for relatively low traffic rates. Large wireless sensor networks at urban or metropolitan scale or long-term monitoring deployments are examples of LPWANs — these are thus the natural framework for the Internet of Things. Since LPWANs involve features and constraints that are not typically addressed in classic wireless networking technologies (e.g. Wi-fi, cellular), new technologies are being proposed and developed to support IoT deployments, some examples being LoRa or SigFox.

The internship aims at:
- Understanding LoRa operation and main features.
- Quantifying LoRa technology by way of experimental measurements, in particular focusing on its transmission range, throughput/capacity, power consumption, MAC protocol performance, etc.
- Based on the measurements and observations obtained, proposing and evaluating new mechanisms to improve the performance of LoRa and adapt its operation to new IoT applications.

To apply or for further information, please contact the internship supervisors.