

## End of studies internship offer – Data science for real estates

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| Titre/Title                                 | Prediction of recovery actions for tenants in default of payment.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Encadrant(s) / Supervisor(s)                | Sébastien Destercke, Sylvain Rousseau, Soundouss Messoudi                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Laboratoire/Laboratory                      | Heudiasyc                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Mots clés/Key words                         | Machine learning, deep learning, data analysis.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Descriptif du sujet/<br>Project description | <p>This internship is part of a partnership between UTC and the company SOPRA STERIA and its real estate department in order to support it in the implementation of solutions based on machine learning for problems related to real estate. Among these issues, SOPRA STERIA and its client HABITAT 76, a social property owner, pay particular attention to tenant management.</p> <p>The objective of this internship is to focus on tenants in default of payment and the various debt recovery actions to be carried out depending on the tenant's profile and the seriousness of their unpaid bills. These actions can be a reminder in the event of a simple forgetfulness, or a visit from a social worker in the event of a critical situation requiring personalized assistance.</p> <p>Prior work was carried out on an anonymized Big Data database provided by SOPRA STERIA in order to extract a dataset for the identification of tenant profiles according to their history. The intern will have to continue this work and add the part related to the recovery actions according to these tasks:</p> <ul style="list-style-type: none"> <li>- Exploration of the database with a focus on recovery.</li> <li>- Classification of the different possible recovery actions.</li> <li>- State of the art of machine or deep learning models applicable to the debt recovery problem to predict the correct procedure for tenants according to their situation.</li> <li>- Implementation of the chosen method and analysis of the results.</li> </ul> <p>The intern will have at their disposal the anonymized Big Data database provided by SOPRA STERIA, the extracted dataset, as well as the functional and technical documents to understand the business and the data. In addition to the supervision of researchers in the Heudiasyc laboratory, they will also have direct contact with SOPRA STERIA and Habitat 76 who will be able to share their business expertise.</p> |
| Possibility of PhD                          | Not considered for the moment.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Profil recherché/Sought profile             | <p>The applicant should have a strong background in computer science and/or mathematics, with ideally a specialization in machine learning and/or uncertainty modelling. The applicant should send the following items to <a href="mailto:soundouss.messoudi@hds.utc.fr">soundouss.messoudi@hds.utc.fr</a>, <a href="mailto:sylvain.rousseau@hds.utc.fr">sylvain.rousseau@hds.utc.fr</a> and <a href="mailto:sebastien.destercke@hds.utc.fr">sebastien.destercke@hds.utc.fr</a> :</p> <ul style="list-style-type: none"> <li>• A complete CV</li> <li>• Motivation letter</li> <li>• Reference letters or mail of reference persons</li> <li>• Other items the applicant may find relevant (papers, reports, ...)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |