

BSc and MSc project in the ASPARI research unit

Company and Location	         
Type of project	Bachelor
Title of topic	Electrical density measurement to measure asphalt density
Project background / context	<p>An Electrical Density Gauge (EDG) is a field-testing device used to assess the moisture and density of compacted soils and evaluate the level of compaction of a compacted fill. The EDG can measure density, moisture content and percent compaction of soil. The device uses four darts, which are driven into the soil and used as electrodes to measure the dielectric properties of a soil to determine moisture level and density.</p> <p>The EDG approach has significant advantages compared to other methods, such as the sand cone or the nuclear density gauge. Compared to the sand cone test method, the EDG is significantly less time consuming and has less chance for errors. Compared to the nuclear density gauge, the EDG requires less or similar manual effort. Less site preparation is required and once the darts are in place the actual test is performed within 20 seconds. The operator drives darts into the material to be tested, while the nuclear method requires a probe to be driven into the material. The darts for the EDG require less effort for removal than the nuclear gauge pin. The EDG also includes built-in "fuzzy-logic" that will recognize when the material changes and will notify the operator so a different soil model may be used rather than assuming that one proctor fits a single site.</p> <p>It is argued if we can use EDG for measuring asphalt density and if it is accurate enough. In this research we want to see how EDG is accurate in asphalt roads.</p>
Main research question	Is EDG is accurate enough for testing asphalt density? Which parameters should be taken into account for having higher accuracy? Can EDG be used for real time asphalt density measurement?
Research method(s)	- Empirical study
Main outputs	Compression between nuclear density gauge and electrical density gauge with laboratory measurements in asphalt roads
Contact(s) at the company	The chosen company will be decided upon in discussion with the student (there are various options)
Start date	ASAP
Contact at the UT	Seirgei Miller s.r.miller@utwente.nl ; Denis Makarov d.makarov@utwente.nl ; Afshin Jamshidi a.jamshidi@utwente.nl