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Thesis Title	<i>System design for Urban Heat Island mitigation with the use of thermoelectric materials</i>
Supervisor	M. Santamouris, Professor
Summary	<p>The present dissertation investigates the thermal outcome of thermoelectric pavements in the build environment as a plan for urban heat island mitigation. The study aims at testing the cooling and heating possibilities of thermoelectric pavements in an urban space, through developing and modelling a prototype for an in-depth analysis of its energy gain or loss due to heat exchange between the experimental surface and atmospheric air.</p> <p>There were two case studies held, the first consisted of a sett block and the second of a typical pavement tile, in both cases a thermoelectric element, with an assembled heatsink, was attached to the material, and a base layout was used as a subsidiary heat transferring mechanism. After the experimental measuring, in indoor environmental conditions, a theoretical modelling code was generated in Matlab.</p> <p>Finally the PHOENICS CFD simulation program was used for the simulation of a pavement, with the above measured thermal behaviour, in an urban environment and its cooling ability in a typical summer day.</p>
Key words	thermoelectric technology, cooling pavement, urban heat island, Matlab coding, cfd simulation
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