1046-05-532 **Anh Vinh Le*** (vinh@math.harvard.edu), 1 Oxford Street, Mathematics Department, Harvard University, Cambridge, MA 02138. *Some combinatorial problems over finite Euclidean and non-Euclidean graphs.*

A classical set of problems in combinatorial geometry deals with the questions of whether a sufficiently large subset of R^d, Z^d or F^d contains a given geometric configuration. Examples are Erdös distance problem, Szemerédi-Trotter theorem and the Furtenberg-Katznelson-Weill theorem. In the finite non-Euclidean spaces, however, the use of known methods, like incidence geometry or Fourier analysis, is nontrivial to the author. We therefore approach the problems using graph theoretic method. Our main tools are graphs associated to the finite Euclidean and non-Euclidean spaces. The advantages of using these graphs are twofold. First, we can reprove and sometimes improve several known results. Secondly, our approach works transparently in the non-Euclidean setting. Due to time constrains, I will only restrict our discussion to a Furtenberg-Katznelson-Weill type theorem and a Szemerédi-Trotter type theorem with its application to sum-product estimate in finite fields. (Received September 06, 2008)