

# MASTER THESIS PROJECT: HORIZONTAL EMBEDDINGS INTO THE STANDARD ENGEL SPACE.

FRANCISCO PRESAS

Quite a lot interest has been posed in Engel topology in the last two years. A conjecture concerning the existence of such objects in a 4-fold has been proved [CPPP]. Mimicking the development of contact topology, attention has first been focused in the existence part: are there plenty of such structures? Afterwards, following contact topology, it is needed to find instances of rigidity. The most natural candidate is the space of embeddings tangent to the Engel structure (there, rigidity showed up in the contact case [Be]). In order to prove rigidity, it is first needed to understand the *easier to handle* space of formal horizontal embeddings. The connected components of that space are easy to classify. The goal of this project is to understand the fundamental group of this space. The claim is that there is a kind of Thurston-Bennequin type invariant completely classifying this fundamental group.

## REFERENCES

- [Be] D. Bennequin *Entrelacements et équations de Pfaff*. Third Schnepfenried geometry conference, Vol. 1 (Schnepfenried, 1982), 87–161, Astérisque, 107-108, Soc. Math. France, Paris, 1983.
- [CPPP] R. Casals, J.L. Pérez, A. del Pino, F. Presas. *Existence h-principle for Engel structures*. arXiv:1507.05342.