Commentary on the habilitation thesis

Geometric constructions and correspondences in action

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The thesis is based on articles [1, 2, 3, 4], all published in indexed international journals. Individual aims and motivations of the articles vary. However, their common feature is the presence of many geometric constructions and correspondences belonging to the general framework of Cartan, respectively parabolic, geometries. The requisite background is described in a wider context in the introductory part of the thesis (chapter I).

Concrete problems covered by the articles concern distinguished curves in Lagrangean and CR contact geometries, invariants of general curves in conformal geometry, details and consequences of a natural correspondence between projective and conformal geometries. In all situations, the standard constructions are used or combined in such a way that is in some respect uncommon. Moreover, although our setting is of a rather functorial nature, we can often provide concrete down-to-earth interpretations. We consider this symbiosis as an interesting and not always automatic feature. Details and further comments not included in the articles are collected in the second part of the thesis (chapter II).

All articles present collective results which are typically based on common discussions, shared ideas as well as details and computations. Thus, contributions of all collaborators are meant to be equivalent. In particular, my contribution to the articles [1, 4] and [2, 3] is 1/2 and 1/5, respectively. In all cases, I was involved in all parts of the process, i.e., providing initial observations, delineating conjectures and dreams, investigating details (including many dead ends), elaborating, extending and collecting partial results, texting, also revising and (in one case) massive rewriting.

References

[1] A. Čap and V. Žádník. On the geometry of chains. *J. Differ. Geom.*, 82(1):1–33, 2009.

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[3] M. Hammerl, K. Sagerschnig, J. Šilhan, A. Taghavi-Chabert, and V. Žádník. Fefferman–Graham ambient metrics of Patterson–Walker metrics. *Bull. London Math. Soc.*, 50(2):316–320, 2018.

[4] J. Šilhan and V. Žádník. Conformal theory of curves with tractors. *J. Math. Anal. Appl.*, 473(1):112–140, 2019.