

Continuous and Discrete Clifford Analysis: Two sides of the same?

by

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There is a rather clear dividing line between study Discrete and Continuous Clifford Analysis. Continuous Clifford Analysis is a well established theory with applications in diverse areas like Electromagnetics, Signal Processing, Robotics and nowadays in Inverse Problems. Discrete Clifford Analysis is a theory under construction driven basically by the recent surge of interest in Numerical Analysis [4, 1, 2], Combinatorics [3, 5] and Quantum Mechanics.

While both theories encode very different structures and use different methods the motivation behind its study is common to both theories if we consider which phenomena they study: Symmetry, dispersion, expansion, and other general phenomena have similar formulations both worlds. Indeed, the essence behind both theories are the languages of Differential Forms and Umbral Calculus.

The aim of this talk is mainly devoted to the discussion of a possible function theory which unifies Continuous and Discrete Clifford Analysis as well. Special emphasize will be given to the general construction of Dirac operators, coordinate vector variables, generating functions, Fischer and Almansi decompositions.

If time doesn't run out too fast, we will speak a little about mimetic discretization as an explicit method to derive integral formulae on the lattice.

References

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