

**Sparse recovery of an electrical network****Authors:**

- Álvaro Samperio, Universidad de Valladolid ([alvaro.samperio@uva.es](mailto:alvaro.samperio@uva.es))

**Abstract:**

We study the problem of recovering the edges and weights of an electrical network from power and voltage data at all vertices.

This problem consists in fitting both an algebraic variety and a graph and it is often ill-posed. In case there are multiple electrical networks which fit the data up to a given tolerance, we seek a solution in which the graph and therefore the algebraic equations associated with the electrical network are sparse, i.e. with few edges and terms.

We propose an algorithm to obtain a sparse solution based on original theoretical results (see [1]). It combines in an iterative procedure the resolution of convex optimization problems and techniques of spectral graph sparsification. We show experimental results of its application.

**References:**

- [1] Samperio, Á., 2023. Sparse recovery of an electrical network. ArXiv preprint: <https://arxiv.org/abs/2304.06676>