Lipschitz continuity of sparse super resolution and its trigonometric approximation

Mathias Hockmann

Osnabrück University

Motivated by the application of neural networks in super resolution microscopy, this talk considers super resolution as the mapping of trigonometric moments of a discrete measure on $[0,1)^d$ to its support and weights. We prove that this map satisfies a local Lipschitz property where we give explicit estimates for the Lipschitz constant depending on the dimension d and the sampling effort. Moreover, this local Lipschitz estimate allows to conclude that super resolution with the Wasserstein distance as the metric on the parameter space is even globally Lipschitz continuous. Based on this, we consider simple and efficiently computable trigonometric approximations of the mapping and see that they inherit the Lipschitz property.