# ON THE INTERPOLATION OF DISCONTINUOUS FUNCTIONS

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In this talk we present some results concerning the interpolation of discontinuous functions. First we consider an index of convergence associated to converging subsequences of a general sequence of real numbers $(x_n)_{n\geq 1}$. Namely, if $L \in \mathbb{R}$, the *index of convergence of* $(x_n)_{n\geq 1}$ *to* $L$ is defined by

$$i\left(x_n; L\right) := 1 - \sup_{\varepsilon>0} \delta_+ \left(\{n \in \mathbb{N} \mid x_n \in ]-\infty, L-\varepsilon] \cup [L+\varepsilon, +\infty[\}\right) \; .$$

The definition can be extended to the cases $L = \pm\infty$ and also to the case where $A \subset \mathbb{R}$. In the case where only one real number has index 1, the concept can be related to the classical statistical convergence.

Using this index we describe completely the behavior of Lagrange operators on Chebyshev nodes

$$L_n f(x) = \sum_{k=1}^{n} \prod_{i\neq k} \frac{x - x_{n,i}}{x_{n,k} - x_{n,i}} f(x_{n,k}),$$

($x_{n,k} = \cos\theta_{n,k}$, $\theta_{n,k} = \frac{(2k-1)\pi}{2n}$) and Shepard operators on equidistant nodes

$$S_{n,s} f(x) = \frac{\sum_{k=0}^{n} f\left(\frac{k}{n}\right) \left|x - \frac{k}{n}\right|^{-s}}{\sum_{k=0}^{n} \left|x - \frac{k}{n}\right|^{-s}} \; ,$$

where $f$ has a finite number of discontinuities of the first kind.