LUDOVICK BOUTHAT, Université Laval

The Hilbert L-matrix and its generalizations

An L-matrix is an infinite matrix which is defined by a sequence $(a_n)_{n\geq 0}$ of positive real numbers and which is of the form

$$A = \begin{pmatrix} a_0 & a_1 & a_2 & a_3 & \cdots \\ a_1 & a_1 & a_2 & a_3 & \cdots \\ a_2 & a_2 & a_2 & a_3 & \cdots \\ a_3 & a_3 & a_3 & a_3 & \cdots \\ \vdots & \vdots & \vdots & \vdots & \ddots \end{pmatrix}.$$

These matrices were studied because of their connection with weighted Dirichlet spaces. In earlier work, we studied the Hilbert L-matrix $A_s = [a_{ij}(s)]$, where $a_{ij}(s) = 1/(\max\{i,j\} + s)$ with $i, j \geq 1$. As a surprising property, we showed that its 2-norm is constant for $s \geq s_0$, where the critical point s_0 was unknown until recently. In this presentation, we will show how this phenomenom arises and we establish that the same property persists for the p-norm of A_s matrices. We will also discuss more general properties of L-matrices.