A note on the numerical evaluation of the Hartman-Watson density and distribution function

The Hartman-Watson distribution is an infinitely divisible probability law on the positive half-axis whose density is difficult to evaluate near zero. We compare three different methods to evaluate this density and show that the straightforward implementation along Yor's explicit formula can be improved significantly by resorting to dedicated Laplace inversion algorithms. In particular, the best method seems to be an approach that is specifically designed for distributions from the Bondesson class, to which the Hartman-Watson distribution belongs. The latter approach can furthermore be extended to yield an efficient Laplace inversion algorithm for evaluating the distribution function of the Hartman-Watson law.

Stichworte:
Laplace inversion, Hartman-Watson law, infinitely divisible distributions, Bondesson class

Intellectual Contribution:
Discipline-based Research