

Computability in $C[0, 1]$

Alexander Melnikov

Victoria University of Wellington, New Zealand

Abstract: I will talk about several recent results about the space of continuous functions on $[0, 1]$ and, more generally, on a compact domain. I will discuss several results many of which I view as highly unexpected, including:

1. A characterization of continuous regular (i.e., automatic) functions on $[0, 1]$.
2. An effective characterization of $C[0, 1]$ among other separable Banach spaces; this answers a question of McNicholl.
3. The effective Banach–Stone duality between K and $C(K; R)$ for profinite K , and its corollaries.
4. The computable and punctual universality of $C[0, 1]$ among all Polish spaces; arguably, this settles a problem posed by Sierpinski in the 1940-s.