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A rich hierarchy of functionals of finite types. (English) Zbl 1215.03057

Summary: We consider typed hierarchies of total, continuous functionals using complete, separable metric spaces at the base types. We pay special attention to the so-called Urysohn space constructed by P. Urysohn. One of the properties of the Urysohn space is that every other separable metric space can be isometrically embedded into it. We discuss why the Urysohn space may be considered as the universal model of possibly infinitary outputs of algorithms. The main result is that all our typed hierarchies may be topologically embedded, type by type, into the corresponding hierarchy over the Urysohn space. As a preparation for this, we prove an effective density theorem that is also of independent interest.

MSC:
03D65 Higher-type and set recursion theory

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