Miroslav Hušek
Variations of uniform completeness related to realcompactness

Abstract: Various characterizations of realcompactness are transferred to uniform spaces giving non-equivalent concepts. Their properties, relations and characterizations are described in this paper. A Shirota-like characterization of certain uniform realcompactness proved by Garrido and Meroño for metrizable spaces is generalized to uniform spaces. The paper may be considered as a unifying survey of known results with some new results added.

REFERENCES

[1] Chekeev A.A., *Uniformities for Wallman compactifications and realcompactifications*, Topology Appl. **201** (2016), 145–156.

[2] Chekeev A.A., Kasymova T.J., *Ultrafilter-completeness on zero-sets of uniformly continuous functions*, submitted to Proceedings Prague Toposym, 2016.

[3] Engelking R., *General Topology*, Heldermann Verlag, Berlin, 1989.

[4] Frolík Z., *A generalization of realcompact spaces*, Czechoslovak Math. J. **13** (1963), 127–137.

[5] Garrido M.I., Meroño A.S., *New types of completeness in metric spaces*, Ann. Acad. Sci. Fenn. Math. **39** (2014), 733–758.

[6] Garrido M.I., Meroño A.S., *The Samuel realcompactification*, Abstracts of Prague Toposym, 2016.

[7] Garrido M.I., Meroño A.S., *The Samuel realcompactification*, submitted to Proceedings Prague Toposym, 2016.

[8] Gillman L., *Real-compact spaces (Q-spaces)*, Bull. Amer. Math. Soc. **63** (1957), 144–145.

[9] Gillman L., Jerison M., *Rings of Continuous Functions*, Van Nostrand Co., Princeton, NJ-Toronto-London-New York, 1960.

[10] Hejcman J., *Boundedness in uniform spaces and topological groups*, Czechoslovak Math. J. **9** (1959), 544–563.

[11] Hejcman J., *On conservative uniform spaces*, Comment. Math. Univ. Carolin. **7** (1966), 411–417.

[12] Herrlich H., *Fortsetzbarkeit stetiger Abbildungenand Kompaktheitsgrad topologischer Räume*, Math. Z. **96** (1967), 64–72.

[13] Hewitt E., *Rings of real-valued continuous functions, I*, Trans. Amer. Math. Soc. **64** (1948), 45–99.

[14] Hušek M., *The class of k-compact spaces is simple*, Math. Z. **110** (1969), 123–126.

[15] Hušek M., Pulgarín A., *Banach-Stone-like theorems for lattices of uniformly continuous functions*, Quaest. Math. **35** (2012), 417–430.

[16] Hušek M., Pulgarín A., *When lattices of uniformly continuous functions on X determine X*, Topology Appl. **194** (2015), 228–240.

[17] Isbell J.R., *Euclidean and weak uniformities*, Pacific J. Math. **8** (1958), 67–86.

[18] Isbell J.R., *Algebras of uniformly continuous functions*, Ann. of Math. **68** (1958), 96–125.

[19] Isbell J.R., *Uniform Spaces*, Math. Surveys, 12, American Mathematical Society, Rhode Island, 1964.

[20] Katětov M., *On real-valued functions on topological spaces*, Fund. Math. **38** (1951), 85–91.

[21] Mrówka S., *Some properties of Q-spaces*, Bull. Acad. Polon. Sci. Ser. Math. **5** (1957), 947–950.

[22] Mrówka S., *An elementary proof of Katětov's theorem concerning Q-spaces*, Michigan Math. J. **11** (1964), 61–63.

[23] Nachbin L., *Topological vector spaces of continuous functions*, Proc. Nat. Acad. Sci. U.S.A. **40** (1954), 471–474.

[24] Njastad O., *On real-valued proximity mappings*, Math. Ann. **154** (1964), 413–419.

[25] Pelant J., *Reflections not preserving completeness*, Seminar Uniform Spaces (Prague 1973–1974), pp. 235–240.

[26] Rice M.D., Reynolds G.D., *Completeness and covering properties of uniform spaces*, Quart. J. Math. Oxford **29** (1978), 367–374.

[27] Rice M.D., *Subcategories of uniform spaces*, Trans. Amer. Math. Soc. **201** (1975), 305–314.

[28] Shirota T., *On spaces with a complete structure*, Proc. Japan Acad. **27** (1951), 513–516.

[29] Shirota T., *A class of topological spaces*, Osaka Math. J. **4** (1952), 23–40.

[30] Weir M.D., *Hewitt-Nachbin Spaces*, North Holland, Amsterdam, 1975.