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Extension of Mappings and Pseudometrics

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Abstract: The aim of this paper is to show a development of various methods of extensions of mappings and their interrelations. We shall point out some methods and relations entailing more general results than those originally stated.

Key words: Extension of function, extension of pseudometric, metric space.

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REFERENCES

- [1] P.S. ALEKSANDROV, Sur les ensembles de la première classe et les ensembles abstraits., *Compt. Rendus Acad. Sci. Paris* **178** (1924), 185–187.
- [2] R. ARENS, Extensions of functions on fully normal spaces, *Pacific J.Math* **2** (1952), 11–22.
- [3] R. ARENS, Extensions of coverings, of pseudometrics, and of linear-space-valued mappings, *Canad.J.Math.* **5** (1953), 211–215.
- [4] R. BAIRE, Nouvelle démonstration d'un théorème sur les fonctions discontinues, *Bull. Soc .Math. France* **28** (1900), 173–179.
- [5] R. BAIRE, Sur la séries à termes continues et tous de même signe, *Bull. Soc. Math. France* **32** (1904), 125–128.
- [6] R.H. BING, Extending a metric, *Duke Math. J.* **14** (1947), 511–519.
- [7] R.H. BING, A convex metric for a locally connected continuum, *Bull. Amer. Math. Soc.* **55** (1949), 812–819.
- [8] M. BOULINGAND, Sur les modes de continuité de certaines fonctionnelles, *Bull. Sci. Math.* **47** (1923), 1–15.
- [9] L.E.J. BROUWER, Über die Erweiterung des Definitionsbereichs einer stetigen Funktion, *Math. Ann.* **79** (1919), 209–211, 403.
- [10] C. CARATHÉODORY, “Vorlesungen über Reelle Funktionen”, Teubner, Leipzig 1918.

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- [11] E. ČECH, On bicompact spaces, *Ann. of Math. (2)* **38** (4) (1937), 823–844.
- [12] E. ČECH, “Topological Spaces”, (rewritten by Z.Frolík and M.Katětov), Publishing House of the Czechoslovak Academy of Sciences, Prague; Interscience Publishers John Wiley & Sons, London-New York-Sydney 1966.
- [13] J. DIEUDONNÉ, Une généralization des espaces compacts, *J. Math. Pure Appl.* **23** (1944), 65–76.
- [14] C.H. DOWKER, On a theorem of Hanner, *Ark. Mat.* **2** (1952), 307–313.
- [15] J. DUGUNDJI, An extension of Tietze’s theorem, *Pacific J.math.* **1** (1951), 353–367.
- [16] M. FRÉCHET, Prolongement des fonctionnelles continues sur un ensemble abstrait, *Bull. Sci. Math.* **48** (1924), 171–183.
- [17] T.E. GANTNER, Extensions of uniformly continuous pseudometrics, *Trans. Amer. Math. Soc.* **132** (1968), 147–157.
- [18] H. HAHN, Über halbstetige und unstetige Funktionen, *Wiener Akad. Ber.* **126** (1917), 91–110.
- [19] H. HAHN, “Theorie der Reellen Funktionen”, Springer, Berlin 1921.
- [20] O. HANNER, Solid spaces and absolute retracts, *Ark. Mat.* **1** (1951), 375–382.

- [21] F. HAUSDORFF, Mengenlehre, Teubner, Berlin 1914.
- [22] F. HAUSDORFF, Über halbstetige Funktionen und deren Verallgemeinerung, *Math. Z.* **5** (3-4) (1919), 292–309.
- [23] F. HAUSDORFF, Erweiterung einer Homöomorphie, *Fund. Math.* **16** (1930), 353–360.
- [24] F. HAUSDORFF, Erweiterung einer stetigen Abbildung, *Fund. Math.* **30** (1938), 40–47.
- [25] M. HUŠEK, History and development of Hausdorff's work in extension in metric spaces, in Recent Development of General Topology and its Applications, Math. Research 67, Akademie-Verlag, Berlin 1992), 160–169.
- [26] J. ISBELL, On finite-dimensional uniform spaces, *Pacific J. Math.* **9** (1959), 107–121.
- [27] M. KATĚTOV, On real-valued functions in topological spaces, *Fund. Math.* **38** (1951), 85–91, Correction **40** (1953), 203–205.
- [28] B. KERÉKJARTÓ, “Vorlesungen über Topologie”, Springer, Berlin 1923.
- [29] H. LEBESGUE, Sur le problème de Dirichlet, *Rend. Circ. Mat. Palermo* **24** (1907), 371–402.
- [30] M. MANDELKERN, On the uniform continuity of Tietze extension, *Arch. Math. (Basel)* **55** (4) (1990), 387–388.
- [31] I. MARDONES-PÉREZ, M.A. DE PRADA VICENTE, Monotone insertion of lattice-valued functions, *Acta Math. Hungar.* **117** (1-2) (2007), 187–200.
- [32] N.T. NHU, On the extensions of uniformly continuous mappings, *Colloq. Math.* **41** (2) (1979), 243–252.
- [33] N.T. NHU, Extending metrics uniformly, *Colloq. Math.* **43** (1) (1980), 91–97.
- [34] V. NOVOTNÝ, “Extension of Mappings into Banach Spaces” (in Czech), Thesis Charlees Univ., Prague 2010.
- [35] D. PREISS, J. VILIMOVSKÝ, In-Between Theorems In Uniform Spaces, *Trans. Amer. Math. Soc.* **261** (2) (1980), 483–501.
- [36] H.L. SHAPIRO, Extensions of pseudometrics, *Canad. J. Math.* **18** (1966), 981–998.
- [37] A.H. STONE, Paracompactness and product spaces, *Bull. Amer. Math. Soc.* **54** (1948), 977–982.
- [38] H. TIETZE, Über Funktionen, die auf einer abgeschlossenen menge stetig sind, *J. Reine Angew. Math* **145** (1915), 9–14.
- [39] H. TIETZE, Bemerkungen zu den Sätzen von J.Pál über ebene und räumliche Jordansche Kurven, *J. Reine Angew. Math* **145** (1915), 15–25.
- [40] H. TONG, Some characterizations of normal and perfectly normal spaces (announcement), *Bull. Amer. Math. Soc.* **54** (1948), 65.
- [41] H. TONG, Some characterizations of normal and perfectly normal spaces, *Duke Math. J.* **19** (1952), 289–292.
- [42] P.S. URYSOHN, Über die Mächtigkeit der zusammen hängenden Mengen, *Math. Ann.* **94** (1) (1925), 262–295.
- [43] D.L. VALLÉ-POUSSIN, Intégrales de Lebesgue, Fonctions d'Ensemble, Classes de Baire, Gauthier-Villars, Paris 1916.