Operators and Matrices
Volume 11, Number 3 (2017), 759–768
doi:10.7153/oam-11-52

GRAM MATRICES OF REPRODUCING KERNEL HILBERT SPACES OVER GRAPHS III

MICHIO SETO AND SHO SUDA

Abstract. We study reproducing kernel Hilbert spaces induced by inclusion $G_1 \subset G_2$ of two connected graphs having a common vertex set. Under a certain finiteness condition, it is shown that the dimensions of de Branges-Rovnyak complements associated with inclusion $G_1 \subset G_2$ are described by the language of graph theory.

Mathematics subject classification (2010): Primary 47B32, Secondary 05C50.
Keywords and phrases: Reproducing kernel Hilbert space, graph, de Branges-Rovnyak space.

REFERENCES

[1] B. BOLLOBÁS, *Modern graph theory*, Graduate Texts in Mathematics **184**, Springer-Verlag, New York, 1998.
[2] J. A. BALL AND V. BOLOTNIKOV, *de Branges-Rovnyak spaces: basics and theory*, arXiv:1405.2980v1 [math.CA], 12 May 2014.
[3] P. G. DOYLE AND J. L. SNELL, *Random walks and electric networks*, Carus Mathematical Monographs, 22, Mathematical Association of America, Washington, DC, 1984.
[4] P. E. T. JORGENSEN AND F. TIAN, *Discrete reproducing kernel Hilbert spaces: sampling and distribution of Dirac-masses*, J. Mach. Learn. Res. **16** (2015), 3079–3114.
[5] P. E. T. JORGENSEN AND F. TIAN, *Frames and factorization of graph Laplacians*, Opuscula Math. **35**, 3 (2015), 293–332.
[6] P. E. T. JORGENSEN AND E. P. J. PEARSE, *A Hilbert space approach to effective resistance metric*, Complex Anal. Oper. Theory **4**, 4 (2010), 975–1013.
[7] D. SARASON, *Sub-Hardy Hilbert spaces in the unit disk*, University of Arkansas, Lecture Notes in the Mathematical Sciences **10**, A Wiley-Interscience Publication, John Wiley & Sons, Inc., New York, 1994.
[8] M. SETO, *Composition operators induced by injective homomorphisms on infinite weighted graphs*, J. Math. Anal. Appl. **435**, 2 (2016), 1467–1477.
[9] M. SETO, S. SUDA AND T. TANIGUCHI, *Gram matrices of reproducing kernel Hilbert spaces over graphs*, Linear Algebra Appl. **445** (2014), 56–68.
[10] M. SETO, S. SUDA AND T. TANIGUCHI, *Gram matrices of reproducing kernel Hilbert spaces over graphs II (graph homomorphisms and de Branges-Rovnyak spaces)*, Nihonkai Math. J. **26**, 1 (2015), 15–29.
[11] V. I. VASYUNIN AND N. K. NIKOL'SKIĬ, *Quasiorthogonal decompositions with respect to complementary metrics, and estimates of univalent functions*, Leningrad Math. J. **2**, 4 (1991), 691–764.

Paper OaM-11-52