Dynamics on the path space of generalized Bratteli diagrams

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Bratteli-Vershik models have been very successfully applied to the study of dynamics on compact metric spaces and, in particular, in Cantor dynamics. In this talk, we will consider discrete dynamical systems realized on the path space of *generalized Bratteli diagrams*. A generalized Bratteli diagram is a natural extension of the notion of classical (standard) Bratteli diagrams where each level has a countably infinite set of vertices. The structure of such diagrams is determined by a sequence of countably infinite incidence matrices. Generalized Bratteli diagrams form models for non-compact Borel dynamical systems.

In the talk, we will emphasize differences (and similarities) between generalized and classical Bratteli diagrams. We will establish criteria for the existence and uniqueness of tail invariant path-space measures (both probability and σ-finite) and provide criteria for the topological transitivity of the tail equivalence relation. We will describe classes of stationary generalized Bratteli diagrams (hence Borel dynamical systems) that: (a) do not support a probability tail invariant measure, (b) do not admit a continuous Vershik map, (c) are not uniquely ergodic with respect to the tail equivalence relation. We will also provide an application of the theory of stochastic matrices to analyze diagrams with positive recurrent incidence matrices. The talk is based on a joint work with Sergey Bezuglyi, Palle E.T. Jorgensen and Shrey Sanadhya. The work is supported by the NCN (National Science Center, Poland) Grant 2019/35/D/ST1/01375 and the program "Excellence initiative — research university" for the AGH University of Science and Technology.