Subregular $J$-rings of Coxeter systems as quotients of path algebras
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The asymptotic Hecke algebra, or $J$-ring, of a Coxeter system is an associative algebra closely related to the Hecke algebra of the system. We study a subalgebra $J_C$ of $J$ which has a natural basis indexed by the rigid elements of the Coxeter group, where “rigid” means having a unique reduced word. Exploiting the rigidity property, we show that $J_C$ can be realized as a certain quotient of the path algebra of the double quiver of the Coxeter diagram of the system. This allows us to use quiver representations to answer representation-theoretical questions about $J_C$, such as when $J_C$ is semisimple, in terms of graph-theoretical properties of the Coxeter diagram.

Enumerating Anchored Permutations with Bounded Gaps
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Suppose you start on the bottom stair of a staircase with $n$ stairs and climb to the top stair, using up or down steps of no more than $k$ stairs at a time, such that every stair is stepped on exactly once. In how many different ways can you climb the stairs?

We will show that there always exists a finite-depth homogeneous linear recurrence relation to enumerate such stair climbing patterns, which may be expressed as permutations with bounded differences of consecutive entries. We provide explicit recursions for $k = 2$ and $k = 3$, resolving a conjecture that was previously listed on OEIS (A249665). We then use techniques from spectral graph theory to give asymptotic bounds for the sequences for all $k$.

This is joint work with Ken G. Monks and Ken M. Monks.

Weber 223
4–6 pm, Friday, Sep 27, 2019
(Refreshments in Weber 117, 3:30–4 pm)
Colorado State University

This is a joint Denver U / UC Boulder / UC Denver / U of Wyoming / CSU seminar that meets biweekly.
Anyone interested is welcome to join us at a local restaurant for dinner after the talks.