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Jason Thomson La Corte* (jlacorte@uwm.edu), University of Wisconsin-Milwaukee,
Department of Mathematical Sciences, P.O. Box 413, Milwaukee, WI 53201-0413. *Approximating
optimal curvature-constrained paths in nonpositively curved square complexes*. Preliminary report.

We demonstrate a numerical method for solving the Dubins problem with free terminal vector in a nonpositively curved square complex, and show how the solutions to this problem model efficient strategies for reconfiguring a robotic system in motion. We first show how the state space of a particular system can be represented as the Davis complex of a right-angled Coxeter group. We then exhibit computer animations that trace paths in the complex and display the corresponding reconfigurations of the system. Finally, given an initial state, initial direction, and desired objective state, we show how to find a practical and efficient reconfiguration strategy by numerically determining the shortest curvature-constrained path in the state space satisfying the given boundary conditions. (Received September 16, 2014)