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Peter Bubenik* (p.bubenik@csuohio.edu), Department of Mathematics, Cleveland State University, 2121 Euclid Ave. RT 1515, Cleveland, OH 44115. *An introduction to directed homotopy theory.*

Motivated by problems in concurrent computing, one is led to study spaces in which only certain paths are allowed. In particular, the execution paths in the state space are not reversible. Abstractly, we have a topological space with certain directed paths. Directed paths that are homotopic in a directed sense correspond to execution paths that are equivalent: for any input they will give the same output.

Directed homotopy theory has some immediate surprises. There are simple contractible partially-ordered spaces in which there are directed paths that are not (directed) homotopic. A main object of study is the fundamental category, which is the directed analogue of the fundamental groupoid. (Received August 18, 2008)