

Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Human pair walking behavior: evaluation of cooperation strategies¹ ULRICH DOBRAMYSL, University of Oxford, KATARINA BODOVA, IST Austria, RICHARD KOLLAR, Comenius University Bratislava, RADEK ERBAN, University of Oxford — Human walkers are notoriously poor at keeping a direction without external cues: Experimental work by Souman *et al.* with blindfolded subjects told to walk in a straight line revealed intriguing circular and spiraling trajectories, which can be approximated by a stochastic process. In this work, motivated by pair walking experiments by Miglierini *et al.*, we introduce an analysis of various strategies employed by a pair of blindfolded walkers, who are communicating via auditory cues, to maximize their efficiency at walking straight. To this end, we characterize pairs of strategies such as free walking, side-by-side walking and unconditional following from data generated by robot pair walking experiments (using computer vision techniques) and numerical simulations. We extract the mean exit distances of walker pairs from a corridor with finite width to construct phase portraits of the walking performance. We find intriguing cooperative effects leading to non-trivial enhancements of the efficiency at walking straight.

¹The research leading to these results has received funding from the European Research Council under the European Community's Seventh Framework Programme (FP7/2007-2013) / ERC grant agreement No. 239870; and from the Royal Society through a Research Grant.

Ulrich Dobramysl
University of Oxford

Date submitted: 13 Nov 2014

Electronic form version 1.4