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Co-Authorship Form

This form is to accompany the submission of any PhD that contains published or unpublished co-authored work. **Please include one copy of this form for each co-authored work**. Completed forms should be included in all copies of your thesis submitted for examination and library deposit (including digital deposit), following your thesis Acknowledgements. Co-authored works may be included in a thesis if the candidate has written all or the majority of the text and had their contribution confirmed by all co-authors as not less than 65%.

Please indicate the chapter/section/pages of this thesis that are extracted from a co-authored work and give the title and publication details or details of submission of the co-authored work. Cooper, J. and Nicolescu, R. (2019) 'The Hamiltonian Cycle and Travelling Salesman Problems in cP Systems', Fundamenta Informaticae. Edited by L. Pan, M. J. Pérez-Jiménez, and G. Zhang, 164(2–3), pp. 157–180. doi: 10.3233/FI-2019-1760. This paper forms the basis of Chapter 4 "The Hamiltonian Path and Travelling Salesman Problems". A portion of it summarising cP systems was also incorporated into Chapter 3 "cP systems: P Systems with Complex Symbols". This journal paper is partially based on an earlier conference paper: Cooper, J. and Nicolescu, R. (2017) 'The Travelling Salesman Problem in cP Systems', in Zhang, G. et al. (eds) Pre-proceedings of Asian Conference on Membrane Computing. Chengdu, China, pp. 9–21. Available at: http://ppage.psystems.eu/index.php/Papers. The main difference is the addition of a substantial section to address the Hamiltonian Path & Cycle problems, and the aforementioned cP systems summary that was included in Chapter 3.

Nature of contribution by PhD candidate	Wrote paper. Prepared figures. Programmed F# and Erlang simulations. Worked with Radu Nicolescu to devise the cP systems ruleset.
Extent of contribution by PhD candidate (%)	70

CO-AUTHORS

Name	Nature of Contribution
Radu Nicolescu	Provided editorial support. Provided substantial support on devising cP systems ruleset. Contributed to the Prolog simulation.

Certification by Co-Authors

The undersigned hereby certify that:

- the above statement correctly reflects the nature and extent of the PhD candidate's contribution to this work, and the nature of the contribution of each of the co-authors; and
- that the candidate wrote all or the majority of the text.

Name	Signature	Date
Radu Nicolescu		28/09/2021