

## MODELING COMMUTERS DYNAMICS AS A COMPLEX NETWORK: THE INFLUENCE OF SPACE

Michele CAMPAGNA  
Lecturer  
Dipartimento di Ingegneria del Territorio,  
Università degli Studi di Cagliari  
Piazza d'Armi 16, Cagliari 09123  
Italy  
Tel: +39 070 675 5206  
Fax: +39 070 675 5215  
E-mail: [campagna@unica.it](mailto:campagna@unica.it)

Alessandro CHESSA  
Lecturer  
Dipartimento di Fisica, INFM  
Università degli Studi di Cagliari  
Complesso Universitario di Monserrato,  
Monserrato 09042  
Italy  
Tel: +39 070 675 4844  
Fax: +39 070 510171  
E-mail: [alessandro.chessa@dsf.unica.it](mailto:alessandro.chessa@dsf.unica.it)

Giancarlo DEPLANO  
Full professor  
Dipartimento di Ingegneria del Territorio,  
Università degli Studi di Cagliari  
Piazza d'Armi 16, Cagliari 09123  
Italy  
Tel: +39 070 675 5203  
Fax: +39 070 675 5215  
[gdeplano@unica.it](mailto:gdeplano@unica.it)

Simone CASCHILI  
Doctoral student  
Dipartimento di Ingegneria del Territorio,  
Università degli Studi di Cagliari  
Piazza d'Armi 16, Cagliari 09123  
Italy  
Tel: +39 070 675 5210  
Fax: +39 070 675 5215  
E-mail: [scaschili@unica.it](mailto:scaschili@unica.it)

Andrea DE MONTIS  
Senior Lecturer  
Dipartimento di Ingegneria del Territorio  
Sezione Costruzioni e Infrastrutture  
Università degli Studi di Sassari  
via De Nicola  
Sassari, 07100  
Italy  
Tel: +39 079 229241  
Fax: +39 079 229243  
E-mail: [andreadm@uniss.it](mailto:andreadm@uniss.it)

**Abstract:** This study extends previous works developed by the authors analysing the interplay between the dynamics and the economics of the real network underlying the regional inter-municipal commuting system of Sardinia, Italy. Further insights have been earned into the influence of the network spatial properties, by means of network modeling in GIS environment, which takes into account the inter-municipal distance features of the corresponding physical transport network.

The authors discuss how modelling complex networks in a GIS environment may be considered an innovative approach in the field, as it allows to better think spatially about complex network models. In this perspective, they outlook a a working framework on the possible integration settings between GIS and complex networks models.

**Key-words:** complex networks, commuters dynamics, weighted networks, spatial networks, GIS