SYSTEMS SCIENCE AND INFORMATICS UNIT

1. TEACHING AND TRAINING

1.1 Degree and Training Courses

Name of Faculty Member	Subjects taught to MSLIS students during April-2011 and July 2012		
	Mar 2011-Jul 2011	Aug 2011-Feb 2012	Mar 2012-Jul 2012
B. S. Daya Sagar	Geographic Information Systems, MSLIS	Information Storage, Retrieval and DBMS, for MSLIS Programme	Geographic Information Systems, MSLIS
			Elements of Mathematics – II (Part-1), MSLIS
Kaushik Majumdar	Elements of Mathematics II, MSLIS	Not Taught Any Subject	Not Teaching Any Subject
	Data structures and Programming Languages, MSLIS		
Saroj Meher	Data and Text Mining, MSLIS	Elements of Mathematics - I	Data and Text Mining, MSLIS
			Elements of Mathematics – II (Part-2), MSLIS

1.2 Ph.D./D.Sc. Degrees

N/A

1.3 International Statistical Education Centre (ISEC)

N/A

1.4 Professional Examination is Statistics

N/A

2. CONVOCATION

N/A

3. RESEARCH AND OTHER SCIENTIFIC ACTIVITIES

SSIU Research Activities in Computing in Science and Engineering

Broad areas of research at SSIU fall under the category 'Computing in Science and Engineering" essentially to address challenges of both basic and applied nature. Towards this the broad objective of SSIU is to pursue high quality research work related to computing in interdisciplinary

science and engineering, systems science and informatics related topics. Currently faculty members of SSIU are pursuing vigorous research programs in Spatial Informatics, Computational Neuroscience, and Computational Intelligence. Goal is to conduct quality research, in the areas of interest to SSIU—that competes for space for publications in journals of repute—involving advanced spatial statistical tools (e.g. mathematical morphology, fractal geometry, fuzzy set theory, rough set theory, neural networks, digital image processing and analysis, signal theory, game theory etc), and applications of such tools in various domains like geospatial, biology and medicine, and several other socially relevant application domains. We aim to develop frameworks to address all the above components to demonstrate their potential utilities in domains such as (but not limited to) geospatial and neuroscience. These areas of research are presently being carried out in two broad research groups: Spatial Informatics Research Group, and Computational Neuroscience Research Group.

B. S. Daya Sagar, Kaushik Majumdar, and Saroj Meher

Generation of zonal map from point data via weighted skeletonization by influence zone

Data about many variables are available as numerical values at specific geographical locations. A methodology based on mathematical morphology to convert point-specific data into zonal map has been proposed. This methodology relies on weighted skeletonization by zone of influence (WSKIZ) that determines the points of contact of multiple frontlines propagating, from various points spread over the space, at the travelling rates depending upon the variable's strength. This approach has been demonstrated for converting rainfall data available at specific rain gauge locations (points) into a spatially distributed zonal map that suggests zones of equal rainfall.

B. S. Daya Sagar, H. M. Rajashekara, and Partap Vardhan

Derivation of a spatially significant zone within a cluster of zones via dilation distances

The ability to derive spatially significant zones (e.g. water bodies, zones of influence) within a cluster of zones has interesting applications in understanding commonly sharing physical mechanisms. Using morphological dilation distance technique, we introduce geometrically-based criteria that serve as indicator of the spatial significance of zones within a cluster of zones. This