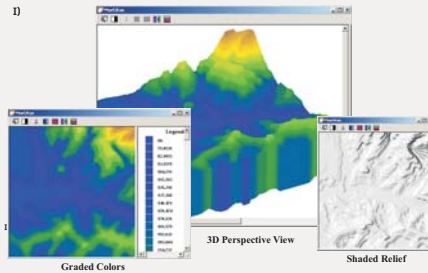


Geographic Information Systems

Software Development

Development of Algorithms for GeoSpatial Data Analysis

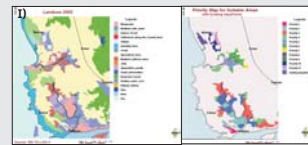


- Spatial data preparation
 - Map digitization
 - Import/Export between other GIS formats
- Spatial Query and Visualization
- Spatial Analysis
 - Raster (Map Algebra, Terrain, Watershed)
 - Vector (TIN, Network, Analysis)
- Image Processing
- Statistics
- Map Composition

GIS Applications & Case Studies

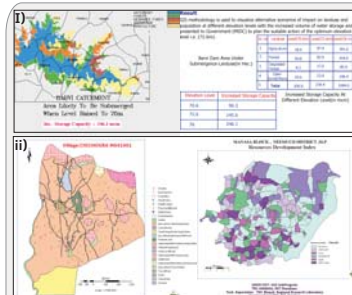
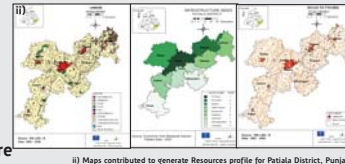
1) Brackish Water Aquaculture Site Selection – In Palghar Taluka Thane District Using Remote Sensing and GIS

Objective : To identify the suitable areas for brackish water aquaculture considering bio-physical parameters



2) Development of Spatial Resources Profile for Patiala District, Punjab

Objective : Study seasonal remote sensing data to understand current cropping pattern and integrate with ancillary thematic data to suggest sustainable agriculture



i) Showing scenario and result before raising the height of dam of Barvi Catchment
ii) A Village map and a resources profile index map for Manasa Block, Madhya Pradesh

GIS Applications & Case Studies

3) Role of GIS in Water Resources Management and Development

Objective : To raise the dam height to meet the increased water demand for industrial and domestic use in Mumbai industrial belt

4) Role of GIS in Rural Development

Objective : Use GIS technology to analyze the spatial distribution of infrastructure along with field data, calculate socio-economic, agro-ecological and human-capital indices using principal component analysis and suggest suitable development strategies

Area of Research in GIS

1) Dynamic Spatial Modeling in GIS

- Used neural network based constrained cellular automata model for Urban growth simulation and forecasting
- Dynamic annealing method is used for training the neural network. Effect of neighborhood size in CA analyzed for training and prediction accuracy

2) Influence of Sampling Point Location Errors on Estimation of Scalar Field with Wireless Sensor Networks

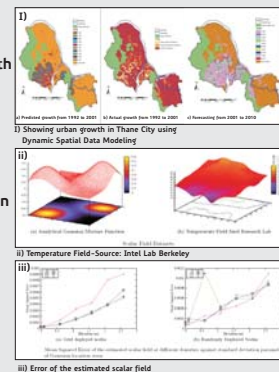
- Using the temperature field from the Intel Lab dataset as an example localization accuracy needed for reliable estimation of the field is evaluated

3) Spatial Data Indexing Algorithms

- Study of Spatial Data Indexing algorithms for points, line and polygons using R-Tree and its variants and suggest suitable data structure for efficient analysis

4) GeoStatistics and Visualization

- Smoothing surface using wavelets and signal processing
- 3-D visualization using OpenGL



CSRE

Centre of Studies in Resources Engineering

Indian Institute of Technology, Bombay

<http://www.csre.iitb.ac.in/>