

8. Applications



LAKSHMAN@OU.EDU

Papers



- We will read papers in meteorology that apply the spatial analysis techniques we have been talking about to specific problems
- Will assign papers to each of you individually
 - You will present the papers in class
 - 30 minute seminar; 10 minutes for discussion
 - Explain the paper
 - If the methodology was described in earlier paper, discuss both papers
 - Critique the paper
 - Read the papers critically
 - What works?
 - What could have been done better?

Spatial Verification



- Weather and Forecasting had a special issue on Spatial Verification Methods
 - <http://journals.ametsoc.org/page/ICP>
- Papers to read and discuss:
 - **Verifying Forecasts Spatially; Intercomparison of Spatial Forecast Verification Methods**
 - **Analyzing the Image Warp Forecast Verification Method on Precipitation Fields**
 - **Application of the Composite Method to the Spatial Forecast Verification Methods Intercomparison Dataset**
 - **Three Spatial Verification Techniques: Cluster Analysis, Variogram, and Optical Flow.**
 - **The Method for Object-Based Diagnostic Evaluation (MODE)**
 - **Application of the SAL Technique.**
 - **Neighborhood Verification: A Strategy for Rewarding Close Forecasts**
 - **A Gaussian Mixture Model Approach to Forecast Verification**

Pattern Recognition in Weather



- Machine Intelligent Gust Front Detection (MIGFA) 1993
 - <http://citeseerx.ist.psu.edu/viewdoc/summary?doi=10.1.1.230.6211>
- A Bayesian Neural Network for Severe-Hail Size Prediction 2001
 - [http://journals.ametsoc.org/doi/abs/10.1175/1520-0434\(2001\)016%3C0600%3AABNNFS%3E2.0.CO%3B2](http://journals.ametsoc.org/doi/abs/10.1175/1520-0434(2001)016%3C0600%3AABNNFS%3E2.0.CO%3B2)
- Radar Echo Classifier
 - http://www.eol.ucar.edu/rsf/NEXRAD/dq_fy02/kessinger_ai2003.pdf
- Predictability of Precipitation from Continental Scale ...
 - [http://journals.ametsoc.org/doi/abs/10.1175/1520-0450\(2004\)043%3C0231%3APOPFCR%3E2.0.CO%3B2](http://journals.ametsoc.org/doi/abs/10.1175/1520-0450(2004)043%3C0231%3APOPFCR%3E2.0.CO%3B2)
- Nowcasting convective storm initiation ...
 - <http://journals.ametsoc.org/doi/pdf/10.1175/2010JAMC2496.1>



- Algorithm for the Identification and Tracking of Convective Cells ...
 - https://www.jstage.jst.go.jp/article/jmsj/90/6/90_2012-602/_article
- Rainfall estimation using a cloud patch classification map
 - http://link.springer.com/content/pdf/10.1007%2F978-1-4020-5835-6_26
- Predicting typhoon-induced storm surge tide ...
 - <http://www.nat-hazards-earth-syst-sci.net/12/3799/2012/nhess-12-3799-2012.pdf>