

Jude Heathcliff Kastens  
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## EDUCATION

- 2008(projected) **Ph.D. Mathematics**, University of Kansas, Lawrence, Kansas  
- emphasis on numerical analysis and statistics
- July 1999 **M.A. Mathematics with Honors**, University of Kansas, Lawrence, Kansas  
- emphasis on time-frequency analysis and signal processing  
  
Thesis Title: *A Review of Four Time-Frequency Distributions*  
- nominated for George Robert Gross Outstanding Masters Project Award
- May 1996 **B.A. Mathematics**, University of Kansas, Lawrence, Kansas
- May 1996 **B.S.E. Secondary Mathematics**, The University of Kansas, Lawrence, Kansas

## PROFESSIONAL EXPERIENCE

### Senior Research Assistant

(2004 – present) Kansas Applied Remote Sensing (KARS) Program, University of Kansas, Lawrence, Kansas

### Research Assistant

(1998 – 2004) Kansas Applied Remote Sensing (KARS) Program, University of Kansas, Lawrence, Kansas

### *Responsibilities*

- Assist in the writing of grant proposals, frequently taking the lead in components detailing technical issues and analytical methods
- Serve as the primary research analyst and/or project manager on all major remote sensing projects involving commercial partner TerraMetrics, Inc. (TMI)
- Oversee new research and remote sensing product development
- Coordinate joint projects with the TMI's partners while serving as the primary point of contact
- Develop and implement land cover applications using advanced mathematical tools such as Fourier analysis, empirical mode decomposition, singular spectrum analysis, and other time series and spectral analysis methods
- Design, develop, and implement software for analysis of remotely sensed data
- Develop and implement remote sensing data processing procedures and algorithms
- Write technical and peer-reviewed texts
- Conduct advanced mathematical research relating remotely sensed information to land cover characteristics, climate, agriculture, and economic information
- Provide general mathematical and statistical expertise to all employees of the Kansas Biological Survey (KBS) as needed
- Update, maintain, and monitor for quality several databases used by numerous scientists at KBS

### *Accomplishments*

- Successfully completed projects while serving roles of Co-PI, Project Director, or Research Analyst
- Developed a stand-alone software package for conducting Fourier analysis on remotely sensed data
- Wrote a technical appendix describing the application of Fourier analysis to time-series data sets
- Developed a procedure capable of exposing artificial interannual value drift in time series imagery

- Created a generalized algorithm capable of generating predictive models relating AVHRR NDVI data to any historical information (crop yields, pheasant populations, etc.)
- Created a regional grassland condition index that is under consideration by the USDA for use in a nationwide grassland insurance program as an indemnity payment trigger
- Developed algorithms to perform watershed analysis using digital elevation maps, as well as novel mathematical models capable of floodplain delineation and estimation of dam breach inundation extent
- Developed a novel mathematical model to facilitate transmission line corridor vegetation monitoring

### **Graduate Teaching Assistant**

(1996 – 1999) Mathematics Department, University of Kansas, Lawrence, Kansas

#### *Classes Taught*

- MATH 122, Calculus II for engineers    Spring 1998, Fall 1998 and Spring 1999
- MATH 121, Calculus I for engineers    Fall 1997
- MATH 104, Pre-calculus                      Fall 1996 and Spring 1997

### **Research Assistant**

(1994 – 1996) Geographic Research, Applications, and Information Laboratory (GRAIL), The University of Kansas, Lawrence, Kansas

#### *Responsibilities*

- Develop procedures and algorithms using ESRI ARC/INFO amls for automated GIS data base construction and analysis
- Project Manager (primarily on the SWIMS III project for Kansas EPA)
- Provide training and support to student workers
- Conduct manual line-lifting and digitizing in a GIS framework

### **Farmhand**

(1986 – present) Kastens, Inc., Herndon, KS

#### *Responsibilities*

- Livestock management
- Crop production and harvest
- Equipment upkeep and record keeping
- General consultant providing mathematical expertise in support of precision agriculture techniques

### **COMPUTER EXPERIENCE**

*Software*            -    MATLAB, ERDAS Imagine, ESRI ARC/INFO, Arcview, Adobe Photoshop  
*Programming*    -    MATLAB, Visual C, C++, Visual Basic, Pascal  
*O/S*                    -    Windows 3.11, 95, 98, 2000, NT 4.0, XP  
                               -    Solaris 1x and 2x, SGI

### **PUBLICATIONS**

#### **REVIEWED PUBLICATIONS**

**Kastens, J.H.**, D.G. Huggins, D.L. Peterson, J.L. Whistler, K.E. Dobbs, S.H. Wang (2007). Raster-based Floodplain and Dam Breach Inundation Estimation Using Digital Elevation Models. To be submitted to *River Research and Analysis*.

Rowley, R.J., **J.H. Kastens**, and K.P. Price (2007). Crop Insurance for Rangeland and Pasture: A Remote Sensing and GIS Solution. *International Journal of Remote Sensing*. In review (submitted May 2007).

**Kastens, J.H.** (2007). Testing Properties of Delete-*d* Cross Validation in a Small Sample Setting. *Journal of Computational and Graphical Statistics*. In review (submitted November 2006).

Rowley, R.J., K.P. Price, and **J.H. Kastens** (2007). Remote Sensing and the Rancher. *Rangeland Ecology and Management*. In press.

Wardlow, B.D., S.L. Egbert, and **J.H. Kastens** (2007). Analysis of Time-Series MODIS 250-Meter Vegetation Index Data for Crop Classification in the U.S. Central Great Plains. *Remote Sensing of Environment*, 108(3): 290-310.

Brown, J.C., W.E. Jepson, **J.H. Kastens**, B.D. Wardlow, J.M. Lomas, and K.P. Price (2007). High temporal resolution remote sensing of modern agricultural production and land modification in the Brazilian Amazon. *GIScience and Remote Sensing*, 44(2): 117-148.

Wardlow, B.D., **J.H. Kastens**, and S.L. Egbert (2006). Using USDA Crop Progress Data and MODIS Time-Series NDVI for Regional-Scale Evaluation of Greenup Onset Date. *Photogrammetric Engineering and Remote Sensing*, 72(11): 1225-1234. Recipient, Leica Geosystems Award for Best Scientific Paper in Remote Sensing, 2007, and John I. Davidson President's Award for Practical Papers, 2007.

**Kastens, J.H.**, T.L. Kastens, D.L.A. Kastens, K.P. Price, E.A. Martinko, and R. Lee (2005). Image masking for crop yield forecasting using time series AVHRR NDVI imagery. *Remote Sensing of Environment*, 99(3): 341-356.

Breshears, D.D., N.S. Cobb, P.M. Rich, K.P. Price, C.D. Allen, R.G. Balice, W.H. Romme, **J.H. Kastens**, M.L. Floyd, J. Belnap, J.J. Anderson, O.B. Myers, and C.W. Meyer (2005). Regional vegetation die-off in response to global-change type drought. *Proceedings of the National Academy of Sciences (USA)*, 102(42): 15144-15148.

**Kastens, J.H.**, M.E. Jakubauskas, D.E. Lerner (2003). Using temporal averaging to decouple annual and non-annual information in AVHRR NDVI time series. *IEEE Transactions on Geoscience and Remote Sensing*, 41(11), 2590-2594.

Jakubauskas, M.E., D.R. Legates, and **J.H. Kastens** (2002). Crop identification using harmonic analysis of time-series AVHRR NDVI data. *Computers and Electronics in Agriculture*. Vol. 37, Issues 1-3, pp.127-139.

Jakubauskas, M.E., D.L. Peterson, **J.H. Kastens**, and D.R. Legates (2002). Time Series Remote Sensing of Landscape-Vegetation Interactions in the Southern Great Plains. *Photogrammetric Engineering and Remote Sensing* 68(10): 1021-1030.

Jakubauskas, M.E., D.R. Legates, and **J.H. Kastens** (2001). Harmonic analysis of time-series AVHRR NDVI data. *Photogrammetric Engineering and Remote Sensing* 67(4): 461-470. Recipient, Boeing Autometric Award for Best Paper in Image Analysis and Interpretation, 2002.

## CONFERENCE PROCEEDINGS

Watts, T., J. Atwood, K. Price, and **J. Kastens** (2005). The Big Picture—Satellite Remote Sensing Applications in Rangeland Assessment and Crop Insurance. USDA Agricultural Outlook Forum 2005, February 24-25, 2005, Arlington, VA. Speech Booklet 2, 26 pp. (Invited paper)

**Kastens, J.H.**, K.P. Price, D.L. Kastens and E.A. Martinko (2001). Forecasting Pre-harvest Crop Yields Using Time Series Analysis of AVHRR NDVI Composite Imagery. *Proceeding, Annual Convention, American Society of Photogrammetric Engineering and Remote Sensing*. St. Louis, Missouri, April 23 - 27.

Kastens, D.L., K.P. Price, **J.H. Kastens** and E.A. Martinko (2001). Using Crop Masks and Remotely Sensed Data to Develop Pre-harvest Forecasts of Winter Wheat Yields in Kansas. *Proceeding, Annual Convention, American Society of Photogrammetric Engineering and Remote Sensing*. St. Louis, Missouri, April 23 - 27.

Jakubauskas, M.E., D.R. Legates, and **J. Kastens** (2000). Crop identification using harmonic analysis of time-series AVHRR NDVI data. ERIM Second International Conference on Geospatial Information in Agriculture and Forestry, January 10-12, 2000, Lake Buena Vista, FL.

## PROJECTS AND AWARDS

Price, K.P., E.A. Martinko, S.L. Egbert, and F.J. deNoyelles, **J. Kastens**, and J. Lomas. 2002. Research in the incubation of commercial remote sensing products. NASA Earth Science Enterprise, Applications Program – \$150,000 (1/1/02-12/31/03).

## POSTERS

Brown, J.C., **J.H. Kastens**, B.D. Wardlow, W. Jepson, A.C. Coutinho, A. Venturieri, J. Lomas, K. Price (2007). Using MODIS to detect cropping frequency variation in mechanized agriculture in Amazonia. XIII Brazilian Symposium of Remote Sensing, Florianópolis, Santa Catarina. (poster)

Rich, P.M., D.D. Breshears, K.P. Price, N.S. Cobb, **J.H. Kastens**, R.G. Balice, and C.D. Allen (2004). Drought-induced mortality in semiarid woodlands: assessing regional consequences of climate change. ESRI International User Conference, San Diego. (poster)

## CONFERENCE PRESENTATION

Paul Rich (LANL), David Breshears (UA), and Kevin Price (KU), Neil Cobb (NAU), **Jude Kastens** (KU), Craig Allen (USGS), and Randy Balice (LANL). "Drought-induced mortality in semiarid woodlands". New Mexico Geographic Information Council (NMGIC) Fall Meeting, 8 October 2004 "Conservation and Environmental GIS"

## MISCELLANEOUS

Reviewed articles for *Remote Sensing of Environment* (2), *Photogrammetric Engineering & Remote Sensing* (3), *Agronomy Journal* (2), *Australian Journal of Agricultural Research* (1), *IEEE Geoscience and Remote Sensing Letters* (1), *Proceedings of the IEEE Conference on Decision and Control* (1).