

Robert P. Schumaker

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Dr. Schumaker earned his PhD in 2007 from the University of Arizona and is an Associate Professor of CIS at the University of Texas at Tyler. He is the author of 19 journal articles, 18 conference papers, a book on sports data mining and has had his research featured in *The Wall Street Journal*, *MIT's Technology Review*, *Slashdot.org* and other venues. Dr. Schumaker is also Associate Editor for *Decision Support Systems* journal and has held multiple editorial board positions.

EDUCATION

B.S. 1997 University of Cincinnati
Civil Engineering
MBA 2001 University of Akron
Management
Ph.D. 2007 University of Arizona
MIS

EMPLOYMENT

2015-Present: Associate Professor, University of
Texas at Tyler
2012-2015: Associate Professor, Central Connecticut
State University
2010-2012: Visiting Assistant Professor, Cleveland
State University
2007-2010: Assistant Professor, Iona College

SELECTED PUBLICATIONS

(41 TOTAL, g-INDEX=29)

Schumaker, R., Jarmoszko, A. T. and Labeledz Jr., C.,
(2016). Predicting Wins and Spread in the Premier
League Using a Sentiment Analysis of Twitter.
Decision Support Systems, 88(8):76-84
Schumaker, R., (2014). Data Mining the Harness
Track and Predicting Outcomes. *Journal of
International Technology and Information
Management*, 22(2):103-107.
Schumaker, R., (2013). Machine Learning the
Harness Track: Crowdsourcing and Varying Race
History. *Decision Support Systems*, 54(3):1370-
1379.
Schumaker, R., Zhang, Y., Huang, C., & Chen, H.,
(2012). Evaluating Sentiment in Financial News
Articles. *Decision Support Systems*, 53(3): 458-
464.
Schumaker, R., (2011). From Data to Wisdom: The
Progression of Computational Learning in Text
Mining. *Communications of the International
Information Management Association*, 11(1): 39-
48.

Schumaker, R., (2010). Analyzing Parts of Speech
and their Impact on Stock Price. *Communications
of the International Information Management
Association*, 10(3): 1-10.
Schumaker, R., & Chen, H., (2010). A Discrete Stock
Price Prediction Engine Based on Financial News.
IEEE Computer, 43(1): 51-56.
Schumaker, R., (2010). Analyzing Parts of Speech
and their Impact on Stock Price. *21st Annual
Conference of the International Information
Management Association (IIMA-2010)*, October
2010. Utrecht, Netherlands
Schumaker, R., (2010). An Analysis of Verbs in
Financial News Articles and their Impact on Stock
Price. *NAACL Workshop on Social Media (#Social
Media-2010)*, June 2010. Los Angeles, CA
Schumaker, R., Zhang, Y., & Huang, C., (2009).
Evaluating Sentiment in Financial News Articles.
*20th Annual Conference of the International
Information Management Association (IIMA-
2009)*, October 2009. Houston, TX
Schumaker, R., (2009). Analyzing Representational
Schemes of Financial News Articles. *The Third
China Summer Workshop on Information Systems
(CSWIM-2009)*, June 2009. Guangzhou, China
Schumaker, R., & Chen, H., (2009). A Quantitative
Stock Prediction System based on Financial News.
Information Processing and Management, 45(5):
571-583.
Schumaker, R., & Chen, H., (2008). Textual Analysis
of Stock Market Prediction Using Breaking
Financial News: The AZFinText System.
*Association for Computing Machinery
Transactions on Information Systems*, 27(2).
Schumaker, R., & Chen, H., (2008). Evaluating a
News-Aware Quantitative Trader: The Effects of
Momentum and Contrarian Stock Selection
Strategies. *Journal of the American Society for
Information Science and Technology*, 59(2): 247-
255.

RELEVANT PROJECTS

The Arizona Financial Text System (AZFinText) is a stock selection research project that utilizes the terms in financial news articles to predict future stock prices. Using the premise that certain terms can move stocks more than others, the goal of the AZFinText system is to leverage arbitrage opportunities that exist when investment experts over and under-react to certain news stories. By analyzing breaking financial news articles and focusing on specific parts of speech, portfolio selection and term weighting, the AZFinText system is a radically different way of looking at stock market prediction. In a comparison study against the top quantitative trading systems, AZFinText outperformed the majority.

In “Textual Analysis of Stock Market Prediction Using Financial News Articles,” we laid the foundation of AZFinText by exploring several different models and linguistic representations. From this study, AZFinText was found to exhibit a 2.84% trading return during the five week study period.

The second paper, “A Quantitative Stock Prediction System based on Financial News,” the focus was on what articles work best at price prediction and how well the system performs against existing human trading experts and quantitative systems. Using the theory that news articles from peer industries may be more effective than articles in disparate sectors, AZFinText found that training based on sectors worked best by achieving an 8.50% trading return. This return also beat the human experts and 6 of the top 10 quantitative funds during the study period.

As a followup, “Evaluating a News-Aware Quantitative Trader: The Effects of Momentum and Contrarian Stock Selection Strategies,” the AZFinText system was further refined as a quantitative trader to take into account portfolio formation based on Momentum and Contrarian stock selection strategies. Using the idea that past winning stocks will continue to win and past losers will lose, AZFinText investigated the predictive value of these strategies and achieved a 20.79% trading return during the study period. This study was also notable because it uncovered evidence of trader over-reaction to news events which led to these abnormal returns.

In a different fork of research, we examined the role of author sentiment as a predictive tool. In “Sentiment Analysis of Financial News Articles,” we used the idea that authors of financial news articles can unwittingly shape stock price movement simply by the tone and polarity of their writing. From this study, we found that sentiment is a valuable

predictive element. Furthermore, AZFinText noted that Contrarian trading activity was occurring during the study period. Articles that were judged to have a positive writing style generally decreased in price while articles with a negative writing style increased in the short term.

A similar study went a step farther and looked into the specific verbs that can move prices the most. In “An Analysis of Verbs in Financial News Articles and their Impact on Stock Price,” AZFinText found that the five verbs with the highest positive impact on stock prices are planted, announcing, front, smaller and crude.

AZFinText has been featured in numerous media outlets in many different languages. Some of the more notable ones are the *Wall Street Journal*, *Slashdot*, *MIT's Technology Review*, *Dow Jones Newswire*, *Motley Fool*, *Crossing Wall Street*, WBIR in Knoxville, TN and Motherboard TV.

AWARDS AND HONORS

CCSU Hall of Honor Gold Award for Research, 2015
IIMA Fellow, 2014
IEEE Senior Member, 2014
Phi Taus Under Forty Award, 2014
ACM Distinguished Speaker Program, 2013-Present
ACM Senior Member, 2013.
Second-most downloaded paper in ACM TOIS for June 2010.
CELTIC Excellence in Teaching Award, 2009.
Nominated for the GPSC Outstanding Research Assistant of the Year, 2005, 2007.
GRS Scholarship – University of Arizona, Spring 2005 – 2007.
Nominated for the James LaSalle Teaching Award, 2004, 2006.

SYNERGISTIC ACTIVITIES

Co-founder and General Partner of sentiSports.com.
Founder and President of The Schumaker Foundation Inc., a 501(c)3 charitable organization devoted to providing educational scholarships to exceptional students in both Divinity and Information Systems.
Mentor for portfolio companies affiliated with the Shaker LaunchHouse, a business incubator that services the Northeast Ohio region. 2011-2012.
University professor since 2007 teaching undergraduate and graduate classes in Business Information Systems, Database, Data Mining, Internet Applications, Programming and Security.
Director of the IS Dept. Computer Lab. 2007-2010.