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Kathleen M. Vogel

Name: Kathleen M. Vogel, Associate Professor

Department: Political Science/Science, Technology, and Society Program

Goals

I am interested in the social, ethical, political, and policy implications of big data/big data analtyics—particularly as they relate to national security issues

Approach

I use qualitative research methods (e.g., interviews, participant observation, ethnography)

Impact & Potential for Collaboration

I am interested in collaborating with technical and social science researchers on big data/analytics issues, particularly that relate to national security

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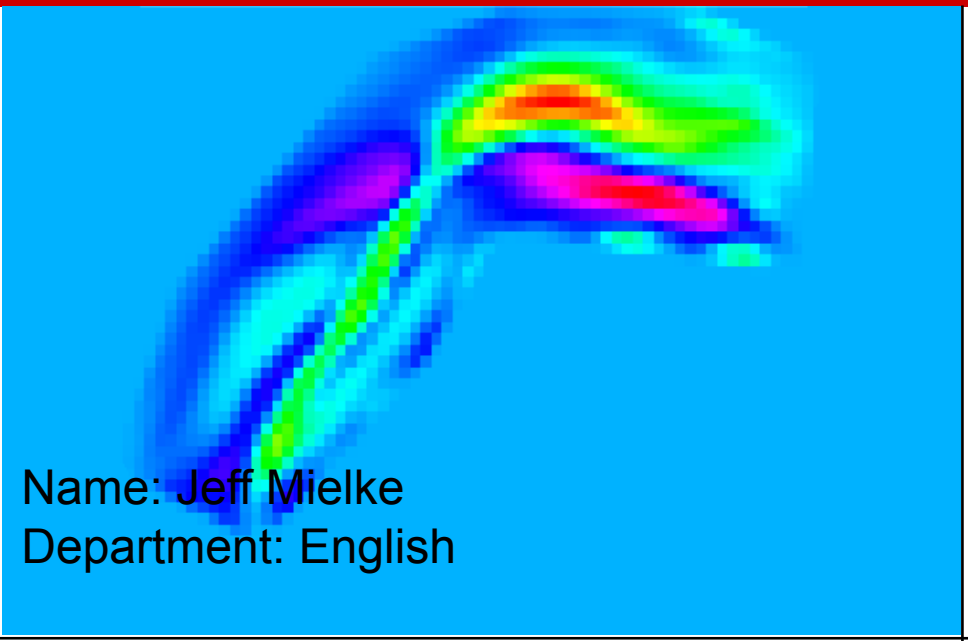
Linguistics



Name: Jeff Mielke
Department: English

Goals

- Understand how language is shaped by physical, cognitive, and social factors.
- Understand how linguistic knowledge is mentally represented.
- Understand how language change begins and how it spreads through a community.

Approach

- Acoustic feature extraction from spontaneous speech corpora (e.g. interview speech, internet speech)
- Acoustic and articulatory analysis of laboratory speech (e.g. airflow measures, ultrasound imaging of the tongue)
- Analysis of typological data (descriptive data from hundreds of

Impact & Potential for Collaboration

- Automatic speech recognition and synthesis
- Speech-language pathology
- Automatic feature extraction from audio and video data (dimensionality reduction, analysis of time series data, etc.)
- Social network analysis

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Collaborative Interaction

Dr. Joann Keyton & Grant Harned
Communication

Goal

Use multi-model data in experimental design to understand process of and influences on inferential judgment:

- Survey data
- Verbal discussion & transcripts
- Web search trace data
- Written reports
- Decision and decision confidence

Small *n* with large data

131 participants in 43 teams of 2 and 3:

- Self-evaluated on 8122 survey items
- Used 33,510 keywords across 6,437 searches
- Examined 13,026 URLs across 62 hours of active web behavior
- Created 167,000 screenshot captures
- Examined 59 potential 3rd party candidates
- Talked in groups 6.33 hours creating 64,924 words
- Wrote 1,340 and 1,520 (draft/final) sentences identifying candidate and confidence in choice

Impact & Potential for Collaboration

Fostered collaboration between/among:

- Communication, computer scientists, & engineers
- Academic and LAS partners
- Within discipline collaboration: group communication and political communication scholars

Creating new analytic techniques for linking survey, transcript, textual, and web trace data

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Transformation of Data to Art

Name: Emil Polyak

Department: Art+Design

Goals

- Dynamic two-way conversation between scientists and artists.

- Art as the translator between science and the public.

- Creative thinking driven research.

Approach

- Find the narrative in the data.
- Build a visual vocabulary from empirical values, theories and real facts.
- Design and develop the platform.
- Tell the story to evoke curiosity and empathy.
- Cultivating creative imagination and researcher aspirations into research topics.

Impact & Potential for Collaboration

- Public engagement with complex data.

- Interdisciplinary student engagement in research.

- Appreciation of the artistic value.

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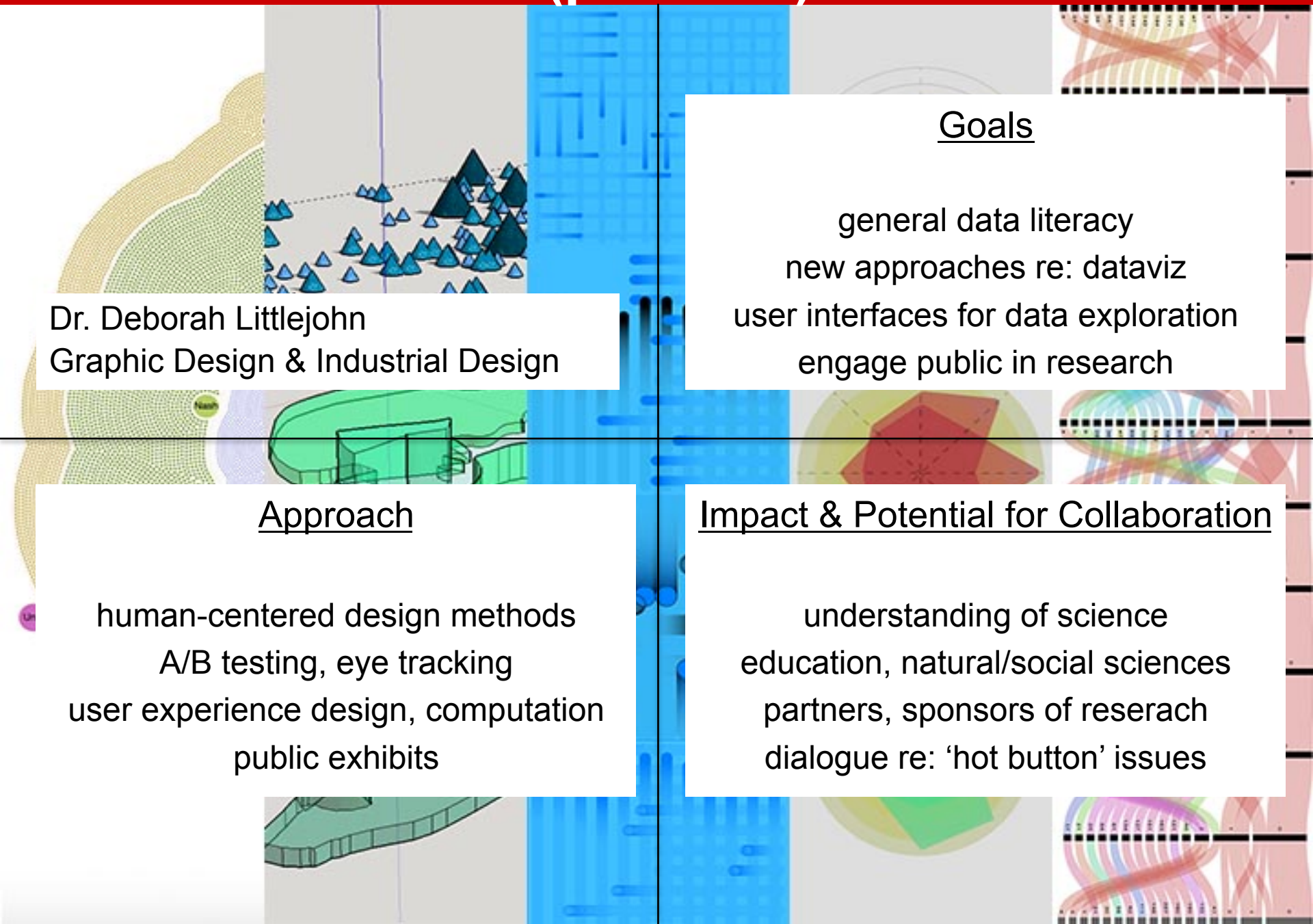
VizCom(putation) Data Translation



Dr. Deborah Littlejohn
Graphic Design & Industrial Design

Goals

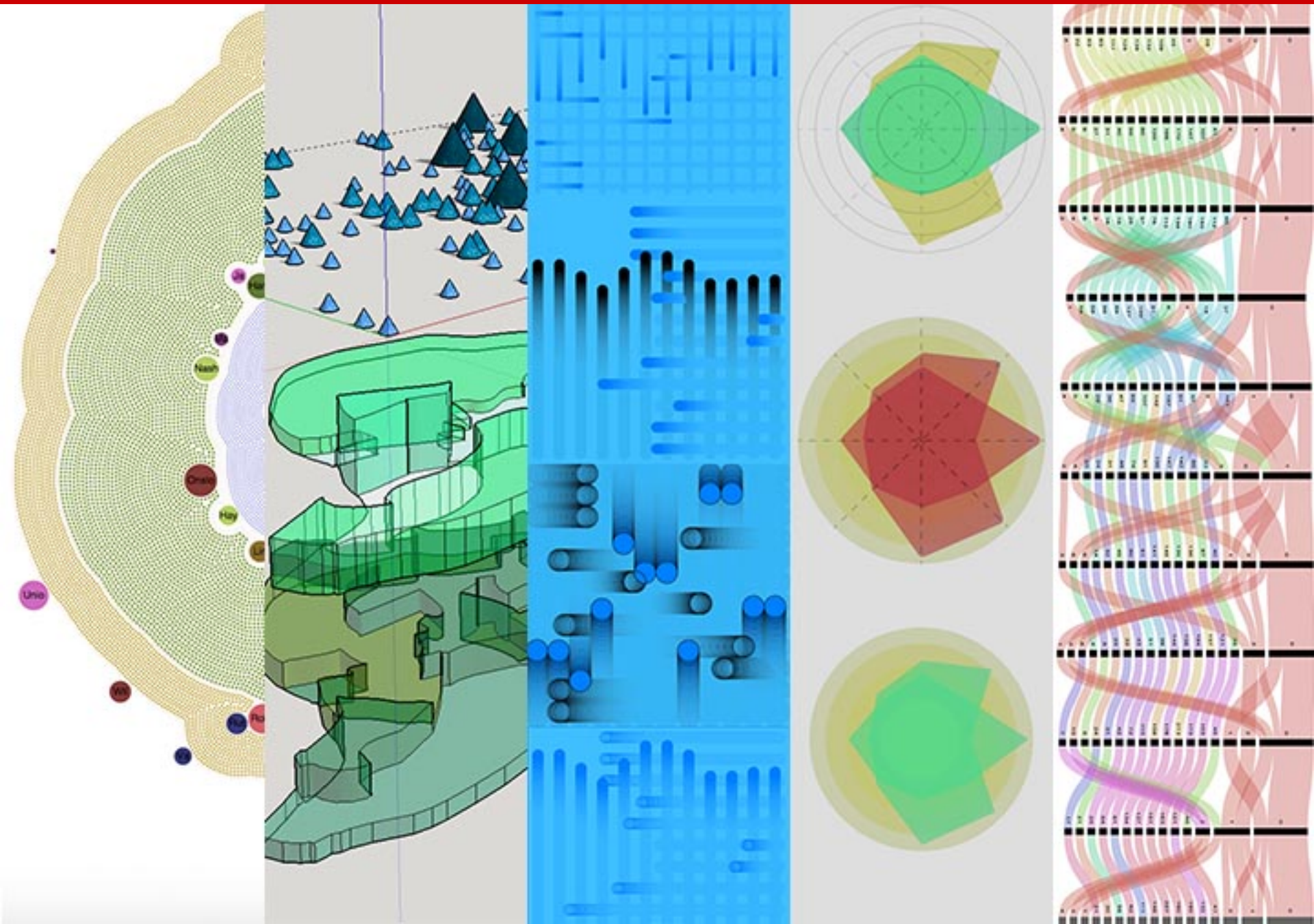
general data literacy
new approaches re: dataviz
user interfaces for data exploration
engage public in research

Approach

human-centered design methods
A/B testing, eye tracking
user experience design, computation
public exhibits

Impact & Potential for Collaboration

understanding of science
education, natural/social sciences
partners, sponsors of reserach
dialogue re: ‘hot button’ issues



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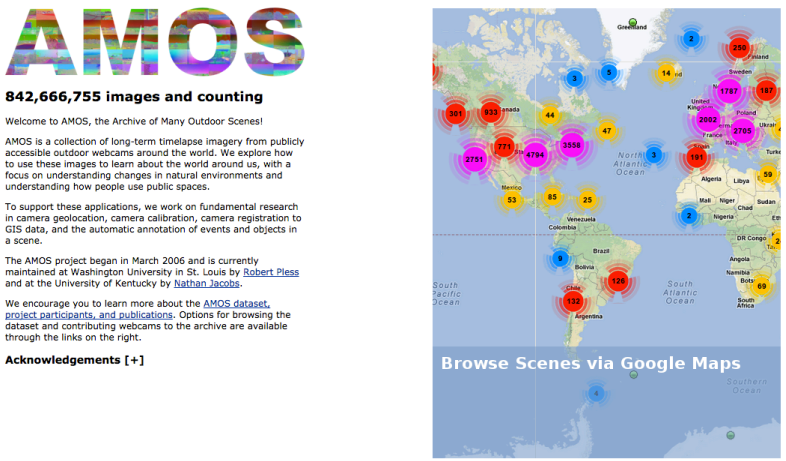
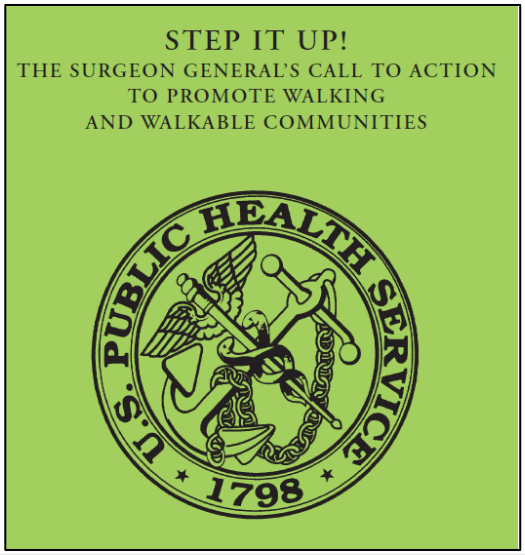
Public Webcams and Active Living

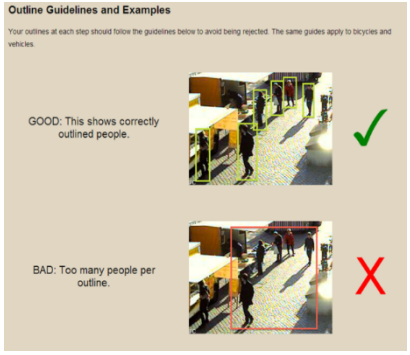


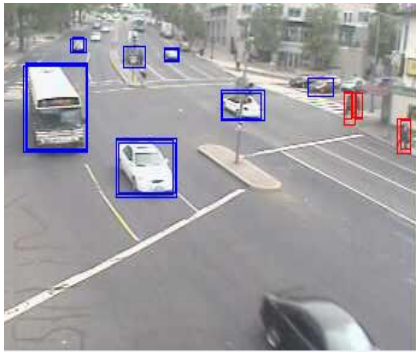
Name: J. Aaron Hipp, PhD
Department: PRTM / CGA

Goals

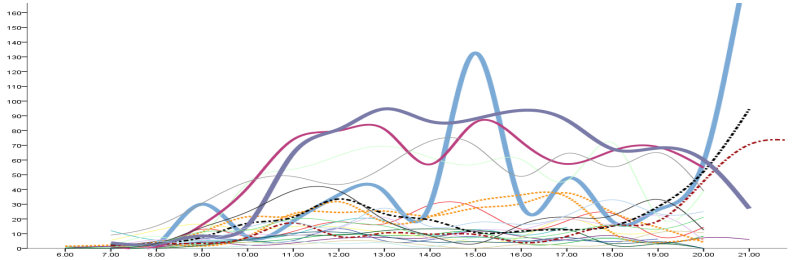


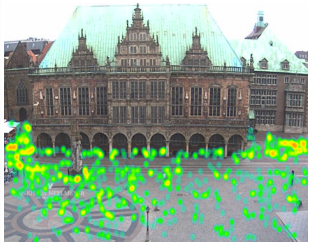
Approach

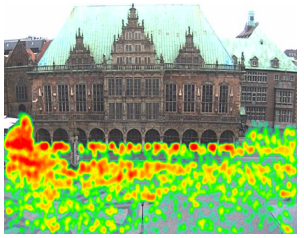




Impact & Potential for Collaboration







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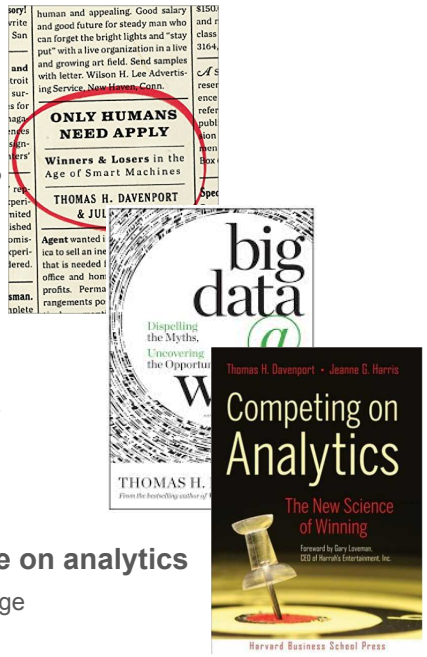
Competing on Analytics

FIRST ANALYTICS®

Michael E. Thompson, CEO

mthompson@firstanalytics.com

1009 Capability Drive, Suite 314 Research II



Michael Thompson, Ph.D.
Managing Director & CEO

- Former Partner, Ernst & Young LLP consulting
- Former Fortune 500 retail executive

Tom Davenport
Chairman

- Author of *Competing on Analytics*
- Acknowledged expert on how companies use analytics to improve decision -making

Practical skills to help you compete on analytics

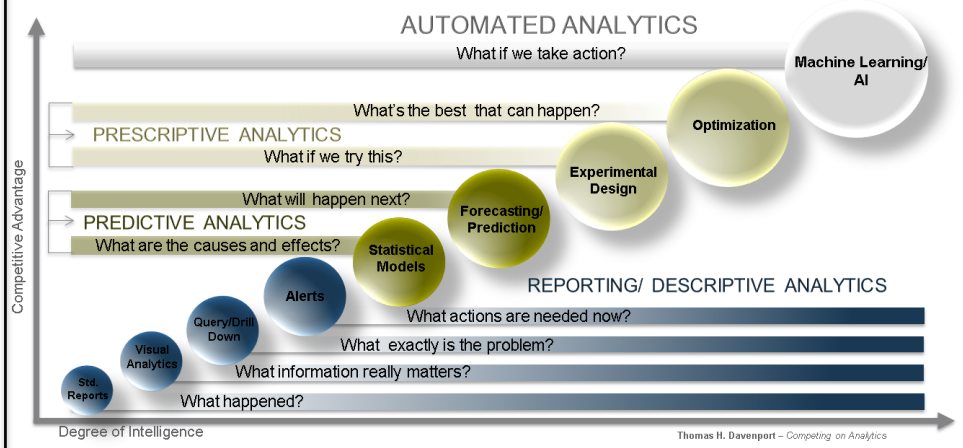
- Business operations and IT knowledge
- Advanced analytical skills

Develop strategies for Competing on Analytics

Plan, build, and implement advanced analytic solutions

Extend the analytic capabilities of our clients

Our Focus | Advanced Analytic Solutions



UNION PACIFIC · Elanco a division of Lilly · sas THE POWER TO KNOW. · PEPSICO · Huron CONSULTING GROUP · NIKE · GENERAL MILLS · Zappos.com · KANGAROO EXPRESS · P&G · TOYOTA · ConAgra Foods · NORTHERN TOOL + EQUIPMENT · Nestlé PURINA · Kellogg's · Chick-fil-A · BD · TTX · freshdirect · CANTEEN · FRESENIUS KABI · Southern California Gas Company · ETS · LOWE'S Home Improvement Warehouse · DPR CONSTRUCTION · CareFusion · A Sempra Energy utility

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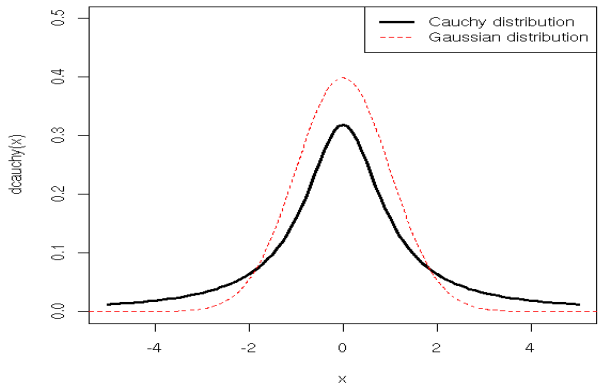
Quantitative Approaches to Manage Heavy Tail Data



Name: Tao Pang, tpang@ncsu.edu
Department: Mathematics

Goals

Seek collaboration opportunities for applications with heavy tail data or extreme events data.

Approach

1. Normal mapping approach for heavy tail data
2. Model building approach based on tail data only
3. Copula approach to model the dependence

Impact & Potential for Collaboration

1. More accurate and efficient than the traditional approaches
2. Application in heavy tail data such as financial data, low frequency but high impact risks (earthquake, hurricane, etc.)
3. NSF Prediction of Risk and Resilience against Extreme Events (PREEVENTS) program

Break

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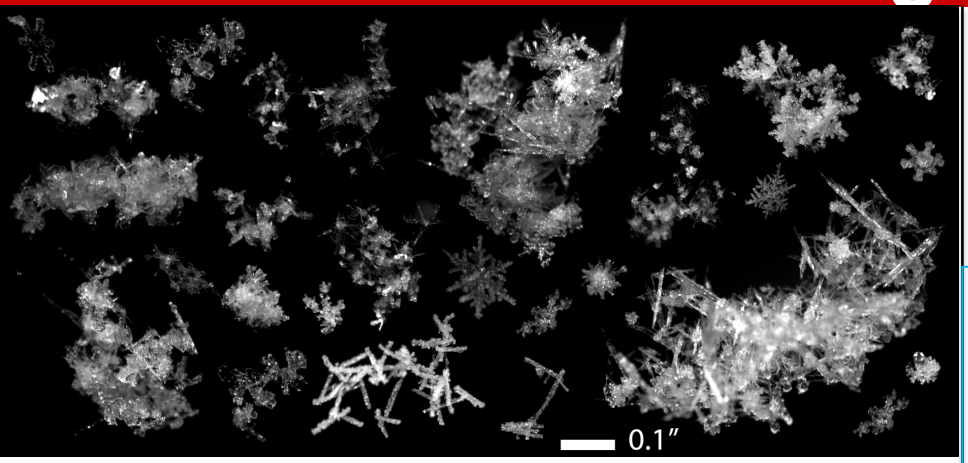
Distilling info from 2D images



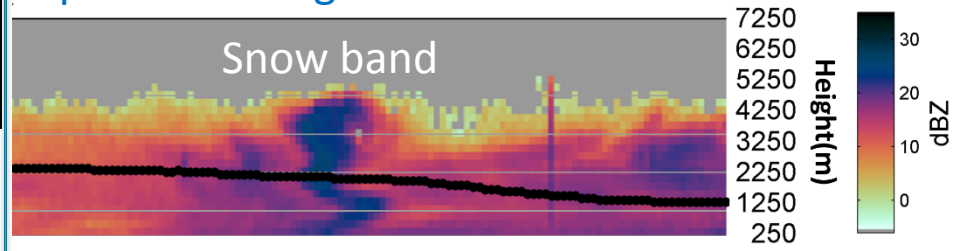
Name: Sandra Yuter
Department: MEAS

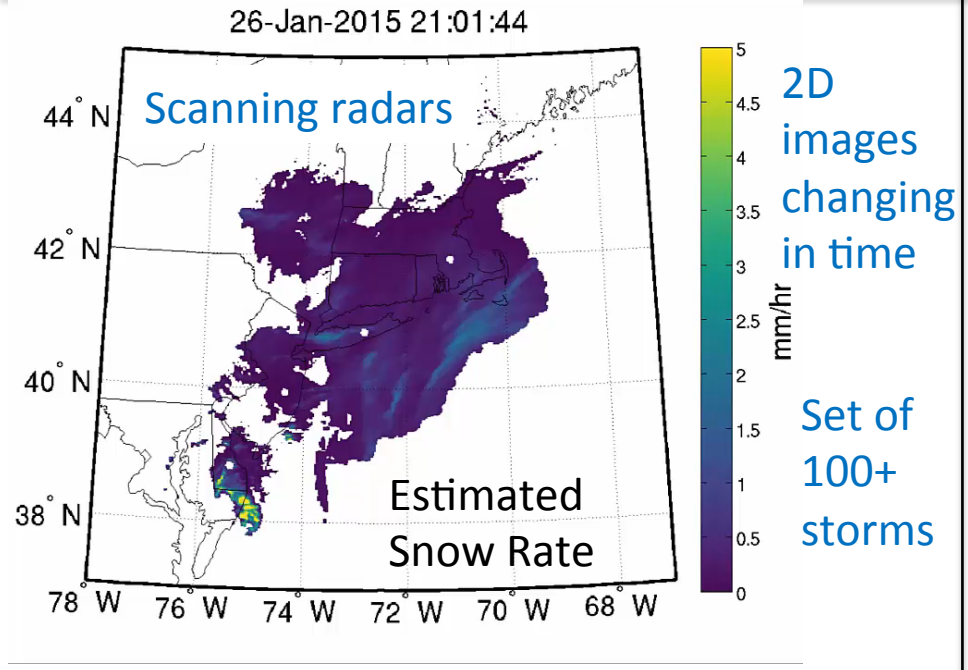
One heavy snow storm yields > 100K snow flake images

Goals

- Overall science goal is to improve understanding and forecasting of snow storms, esp. snow accumulation

Upward looking radar





2D images changing in time

Set of 100+ storms

Impact & Potential for Collaboration

- Image processing for complex images
- Distillation of image content for objective analysis
- Database solutions for extracting information from large data sets of coincident observations obtained at different spatial and time scales [lack of common index across all fields]

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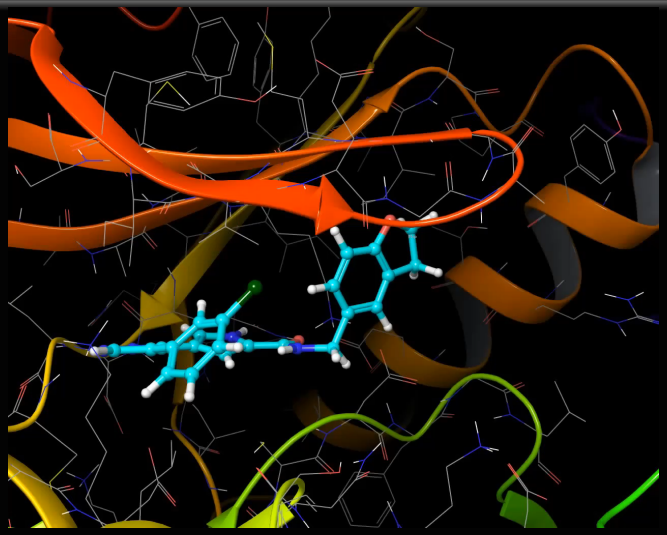
Big Chemical Data



Name: **Denis Fourches**
Department: **Chemistry/BRC [CFEP]**

Research Goals

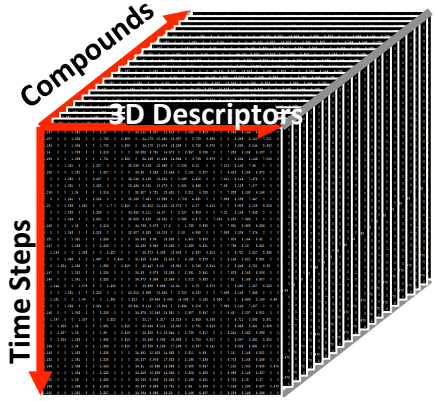
To analyze, model, and forecast complex interactions between chemical structures and various types of biological targets to design novel compounds with the desired activity and safety profiles.

Applications

Drug discovery, agrochemicals, green chemistry, and biocompatible nanomaterials.

Methods

Next-generation QSAR models with 4D descriptors computed from molecular dynamics simulations



QSAR Modeling
(RF, SVM, and deep learning)

QSAR models with boosted reliability and interpretability

Impact & Potential for Collaboration

- Modeling results are used to guide or bias experiments
- New experimental measurements are utilized to validate, re-train, and improve the models
- Research projects building upon high complementarity between computations and experiments

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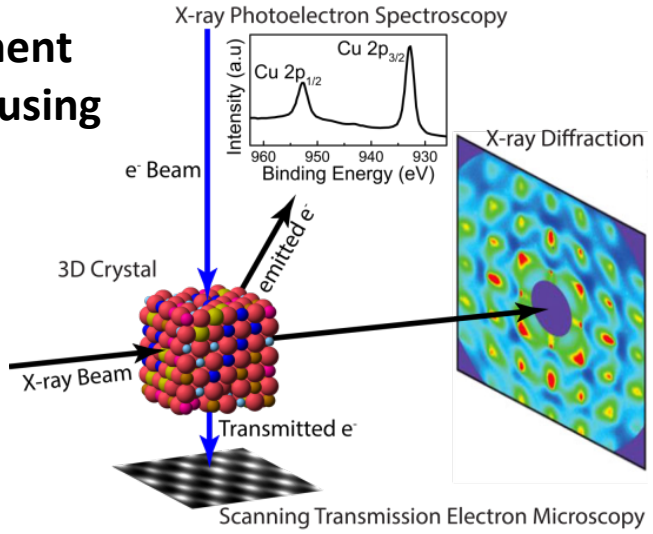
From Data to Atomic Structure

Data is acquired during every materials research and development project in the world, typically by using electrons, photons, or neutrons.

Names:
Jim LeBeau,
Jacob Jones, and
Beth Dickey
Department: Materials Science and Engineering



Goals

- ***Development of new statistical and mathematical methods, algorithms, and software*** for atomic structure determination that combine datasets, models, and theoretical information,
- Educate a ***diverse cadre of graduate students*** who are prepared for interdisciplinary careers in data-enabled science and engineering

Approaches

- ***Collaboration*** between Materials Science, Physics, Statistics, Mathematics, and Computer Science.
- Uncertainty quantification at the source
- Data management
- Feature finding
- Unguided image analysis
- Data compression
- Spatial statistics
- Developing new models
- New inference approaches to this field, such as Bayesian-based methods

Impact & Potential for Collaboration

- The new methods developed will be applicable to ***every single newly developed or researched material*** across the globe.
- We anticipate that our algorithms and methods are ***adopted by academics, manufacturers of measurement instruments, and national laboratories***.
- We envision ***new Center and Traineeship proposals*** on this topic and strong collaboration with national laboratories, e.g. Oak Ridge.

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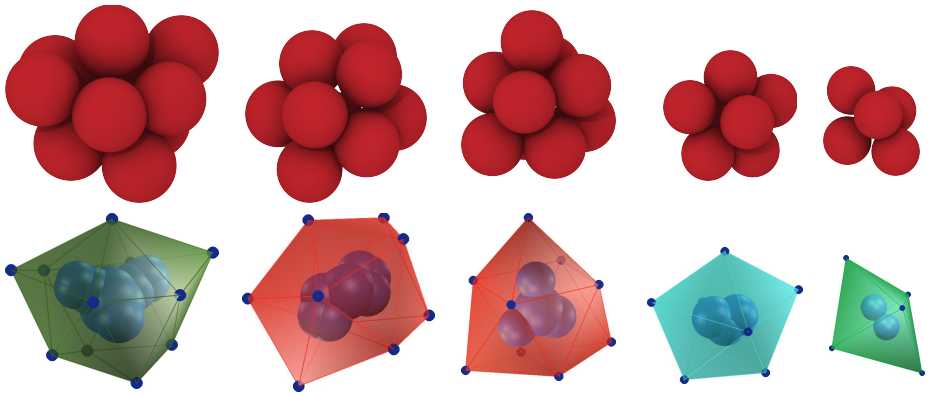
Identifying Structural Defects in Interfaces



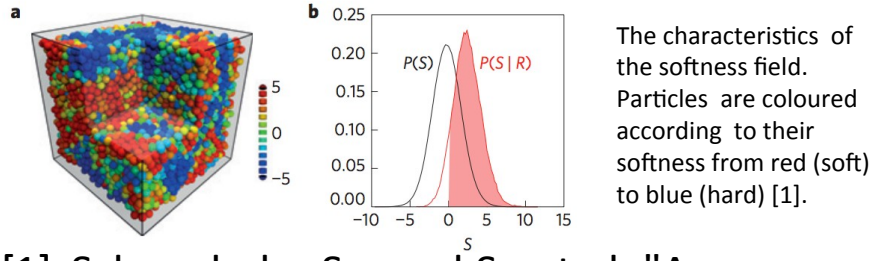
Name: Srikanth Patala
Department: Materials Science and Engineering

Goals

- Grain boundaries are planar disordered defects present in all classes of metallic and inorganic polycrystalline materials and influence a wide array of properties and material phenomena.
- To build a theory of *defects* in disordered systems based on local atomic structure (clusters).
- To identify structural *soft spots* and relate them to structure-property relationships in grain boundaries (GBs).

Approach

- The structure of grain boundaries in polycrystalline systems varies between the two extremes of order and disorder.
- Use generic *structural descriptors (short and long-range) and machine learning tools* to identify soft-spots in various kinetic phenomena related to interfaces.



The characteristics of the softness field. Particles are coloured according to their softness from red (soft) to blue (hard) [1].

[1] Schoenholz, Samuel S., et al. "A

Impact & Potential for Collaboration

- Structure-property relationships of GBs are fundamental for analyzing a variety of phenomena related to material microstructure (abnormal grain growth, recrystallization, texture evolution) and failure (fatigue, stress corrosion cracking and creep)
- Design of novel damage resistant structural materials requires the quantification of the structural features and the properties of interfaces.

Potential for Collaboration:

- Statistical analysis of pointsets and patterns and the development of reduced-order structure-property models.
- High-throughput computation and analysis of structure functions.

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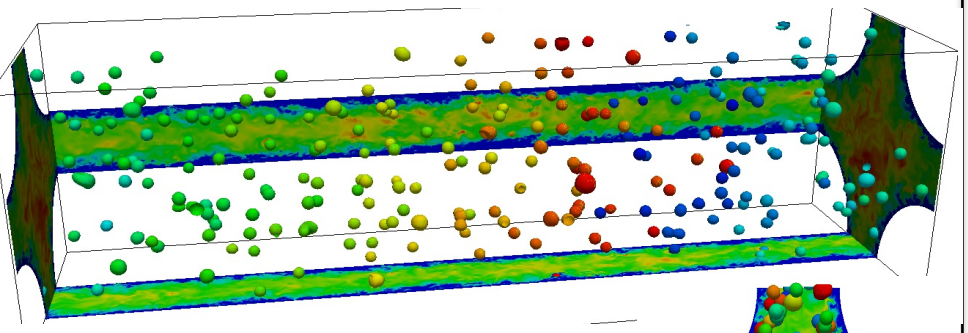
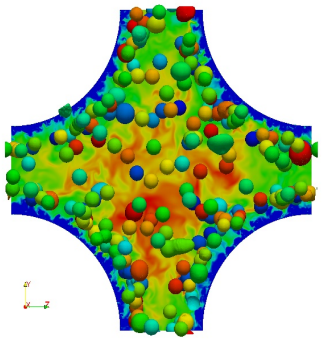
Bubbly Flow Turbulence





Igor A. Bolotnov
Nuclear Engineering

Goals

1. Understand the physics behind bubbly flow turbulence
2. Improve fidelity of computational fluid dynamics scale models
3. Better predict two-phase bubbly flow behavior in nuclear reactor cores
4. Improve safety margins to allow for power uprates and lower costs

Approach

1. Perform large scale simulations of turbulent flow using direct numerical simulation (DNS) and interface tracking methods (ITM) approaches
2. Resolution of all interfaces and all scales of turbulence results in first-principle based numerical data
3. Some simulation meshes are up to 10B points ran over 100K-1M timesteps

Impact & Potential for Collaboration

1. Novel data analysis methods are being developed to take full advantage of expensive simulations (up to 512,000 computing cores)
2. In-situ structure evolution analysis (such as bubbles, turbulence eddies) can give new insight into the complex physical phenomena

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Nuclear Science and Technology

Name: Robert B Hayes
Department: Nuclear Engineering

Goals

1. Cutting edge research in exciting new fields
2. Creation of high quality PhD students
3. Obtaining healthy funding in fields that both advance science and support industry

Approach

1. Thermoluminescence, optically stimulated luminescence and electron paramagnetic resonance
2. Air sampling
3. Gamma, alpha and beta spectrometry
4. Dosimetry and radiation transport modeling

Impact & Potential for Collaboration

1. Nuclear nonproliferation detection and monitoring for forensics, attribution and safeguards measurement applications
2. Emergency Response
3. Spent fuel monitoring and transportation
4. Detector development
5. Novel applications

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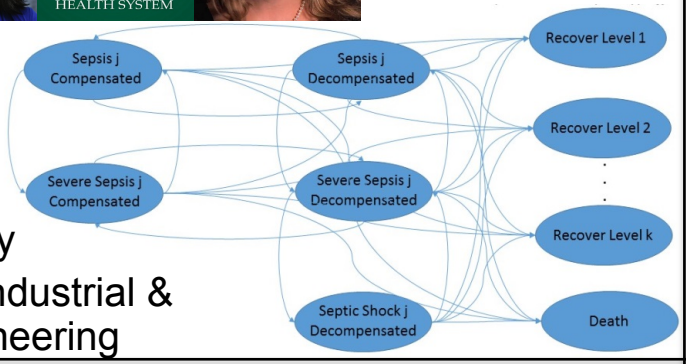
Using Data to Personalize Care



Name: Julie Ivy

Department: Industrial & Systems Engineering

Goals

Current policies are "one size fits all"

Goal to develop personalized screening, intervention, treatment, and disease management policies/strategies

NSF SCH: SEPSIS: Sepsis Early Prevention Support Implementation System

Improve care and outcomes in hospitalized patients with sepsis

Approach

Data Sources: Mayo Clinic & CCHS EHR and Clinical data, NIS, NHANES

Data: time series, longitudinal, sparse data, quantitative and qualitative

Data Security Challenges

Methods: Machine learning, Bilevel programming, Markov modeling, statistical analyses, optimization, queueing, latent class analysis, simulation

Impact & Potential for Collaboration

SEPSIS will:

1. *integrate electronic health records (EHR) and clinical expertise*
2. *to provide an evidence-based framework to diagnose and*
3. *accurately risk-stratify patients within the sepsis spectrum, and*
4. *develop and validate intervention policies that inform sepsis treatment decisions.*

Collaboration: Personalized Medicine Cluster, Poole College of Management: Dr. Fay Payton, UNC, Duke, Michigan, VA, RENCI, MUSC

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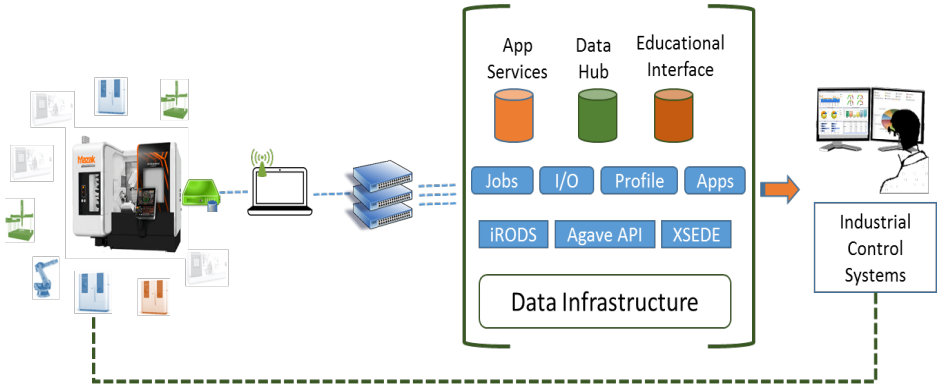
DIME: Manufacturing Cyberinfrastructure

Vision

Project DIME: Data Intensive Manufacturing Environment



Name: Drs. B. Starly, Y.S. Lee, P. Cohen. R. Wysk
Industrial & Systems Engineering, NCSU

Goals

1. Stream data from physical machines, push it to the cloud and run analytics on the data improve productivity.
2. Demonstrate Self-Aware Manufacturing Machines which utilizes data generated from on-board sensors.
3. Partner with Industries/Govt. in building the infrastructure components to realize the manufacturing cyberinfrastructure.

Approach

#1: Just-In-Time Compiler for Product Manufacturing Data

NSF: Cyber-Manufacturing EAGER (with X. Shen)

Impact & Potential for Collaboration

- Cyber-Security in Physical Machines
- Advanced Data Analytics
- Embedded Computing
- Cognitive Machines

Data will be the biggest asset in improving manufacturing operations and empowering US manufacturing strength.

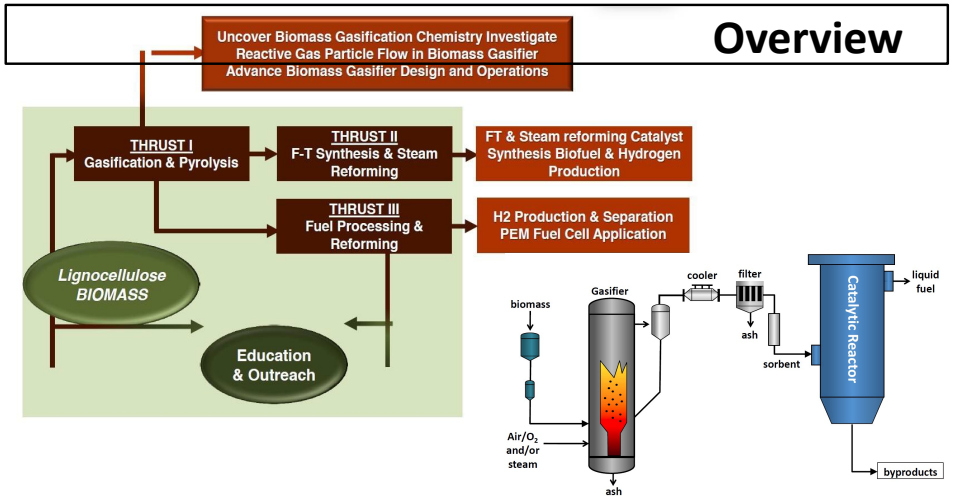
SIMULATION OF FLUIDIZED BED BIOMASS GASIFICATION

Anton Pylypenko [1]; *Yevgenii Rastigejev* [2]; *Abolghasem Shahbazi* [3,4]; *Lijun Wang* [3,4]

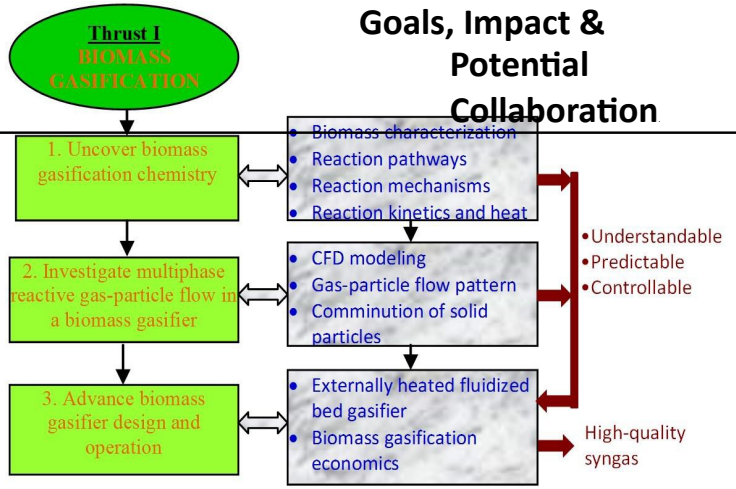
1.NSF-CREST Bioenergy Center/DORED, 2.Department of Mathematics/EES,
3.Department of Chemical, Biological and Bioengineering,
4.Biological Engineering Program, Department of Natural Resources and Environmental Design.

NSF-CREST Bioenergy Center – NC A&T State University, Greensboro, NC

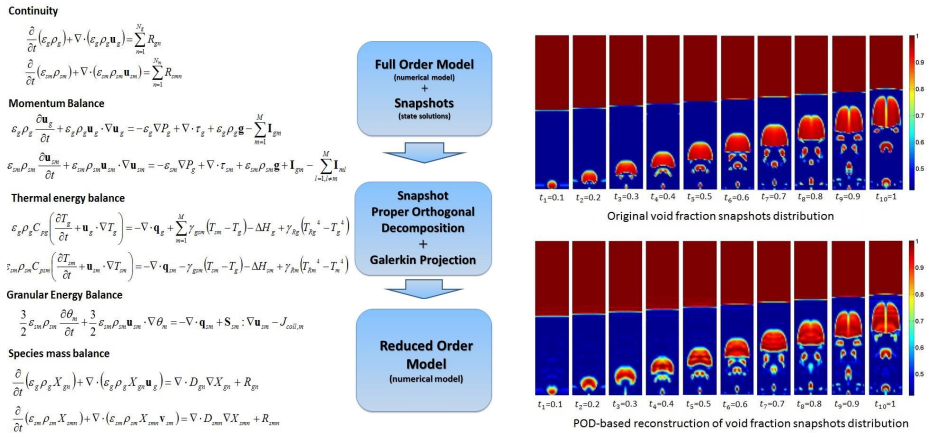
Overview



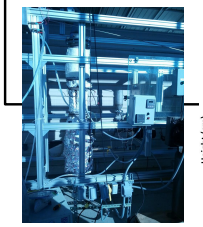
Goals, Impact & Potential Collaboration

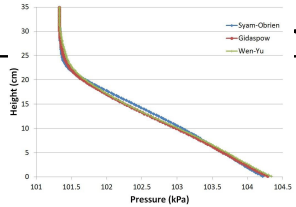


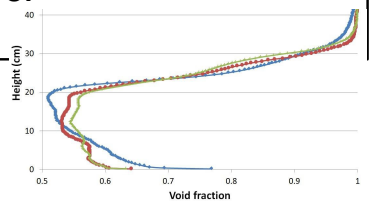
POD-based Reduced-Order Modeling



Fluidized Bed Gas-Solid Flow: Characterization of Dynamics







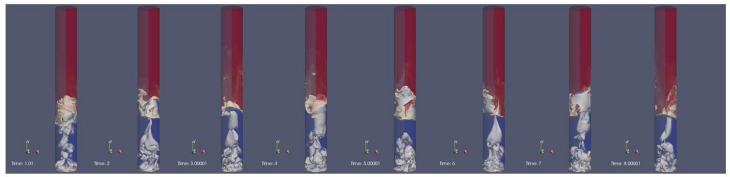


Fig.3 Gas-solid flow evolution (Iso-contours of ε_g built with $\alpha_g = 0.75$)

Break

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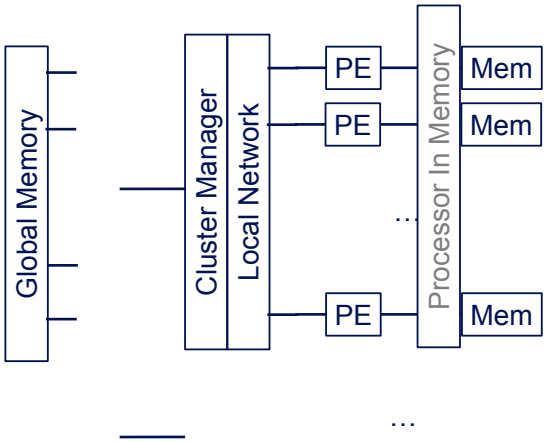
Cognitive Architectures



Name: Paul Franzon

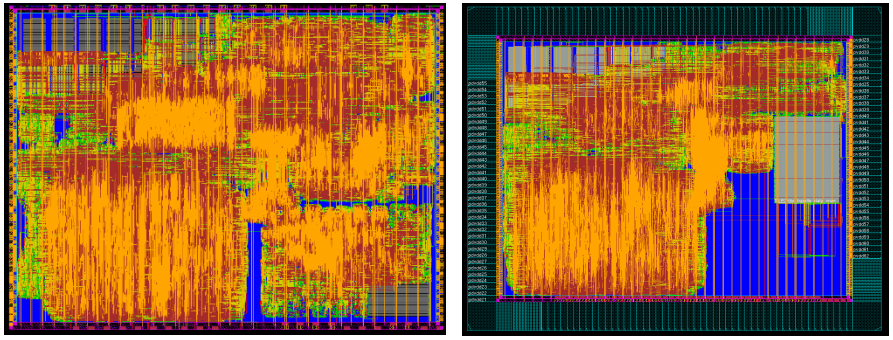
Department: Electrical and Computer Eng.

Goals

- Build computing hardware that provides improved performance and power efficiency over GPUs for cognitive/machine learning tasks
- Focus on algorithms that support in-place incremental learning

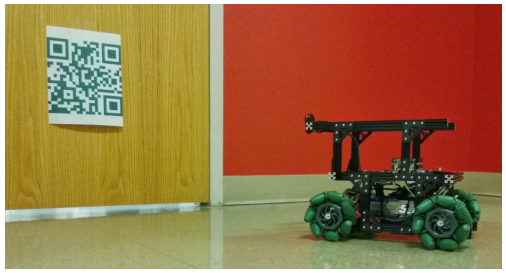
Approach

- 3D chip sent to fab in November
- Focused on HTM and Sparsey
- Working on LSTM, Cogent

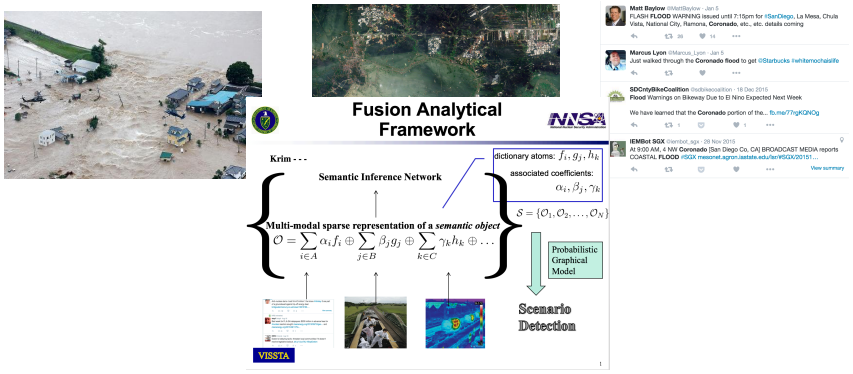


Impact & Potential for Collaboration

- Impact: 10^4 to 10^5 increase in implementation efficiency
- Need applications: Currently focused on robotic SLAM (Self Locationg and Mapping)



Information Fusion for Flood Detection



VISSTA GROUP
Electrical and Computer Engineering

Goals

- Identify floods from natural images
- Extract locational information from social media Twitter with flood identification
- Fuse the flooding data from satellite images
- Density estimation using presence only data

Approach

- Texture analysis and scenario detection
- Natural language processing for Twitter text
- Pansharpening for water index from satellite images
- Maximal entropy modeling and naïve boosted tree model for flood density estimation using presence only data. (require fusing with environmental variables)

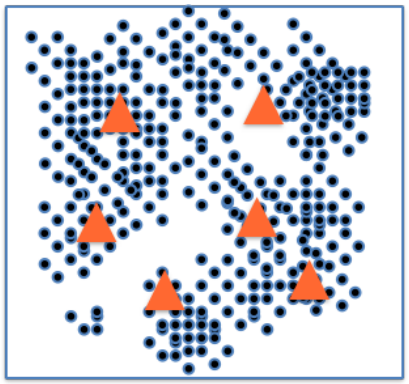
Impact & Potential for Collaboration

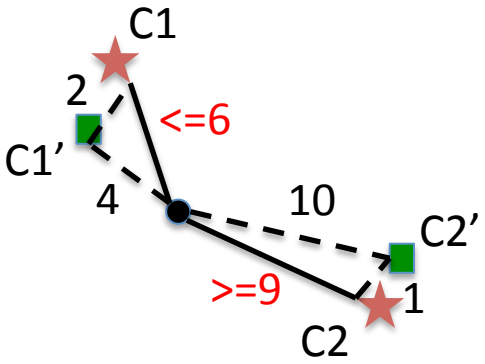
- Develop a Big Data fusion scheme using multi-modality data for hazardous event detection.
- Security issues become a very challenging problem with pervasive data for analysis!
- This is Joint work with Dr. Cervone from PSU Department of Geography

VISSTA

NC STATE UNIVERSITY

TOP Optimizer for Speeding up Data Analytics

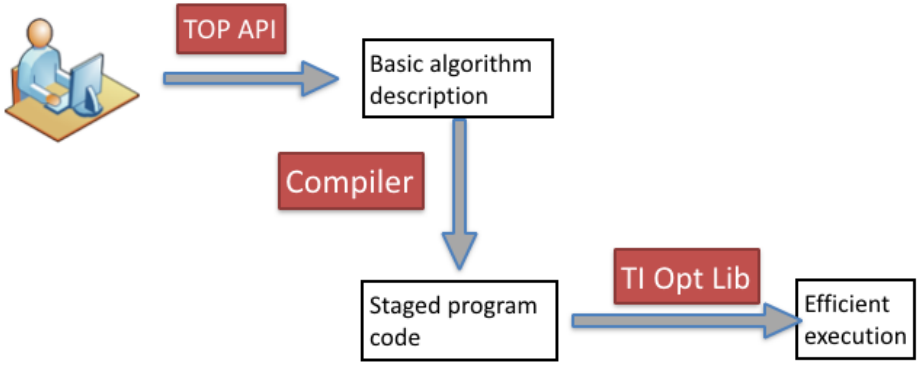




Name: Xipeng Shen (xshen5@ncsu.edu)
Department: Computer Science

Goals

Automate algorithmic optimization for distance-related data analytics

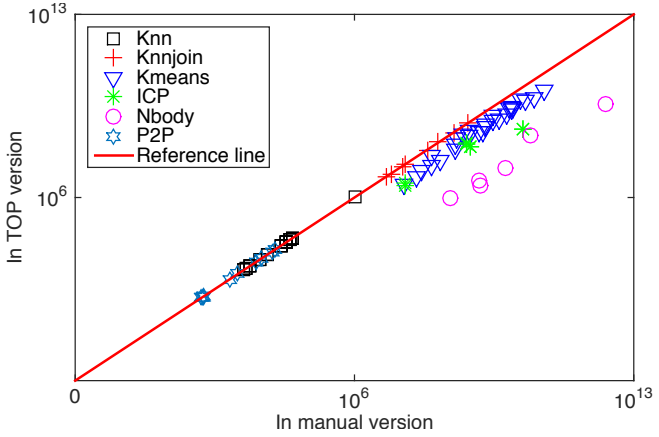


Approach

TOP: **T**riangular inequality-based **op**timizer

- Efficiently using bounds to avoid unnecessary distance computations

Save over 93% distance calculations



Impact & Potential for Collaboration

Average speedups: 50X
(versus 20X by manually optimized algorithms)
Elastic in memory space requirement.

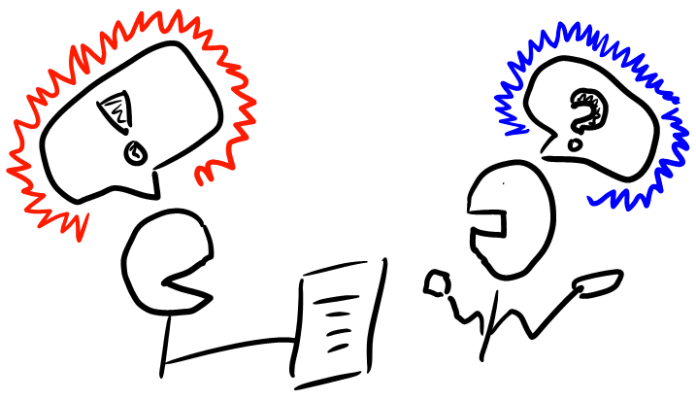
Could have saved decade of manual efforts.

Useful for users who want faster or more scalable data analytics.

[ICML'2015, VLDB'2015]

NC STATE UNIVERSITY

PEER-REVIEW DATA ANALYTICS



Name: Dr. Ferry Pramudianto
Department: Computer Science

Goals

- Create a common repository to study peer-assessment data
- Provide web services to analyze the data (review quality, reputations, feedback summaries)
- Identify & visualize individual & group strengths & weaknesses

Our Approach

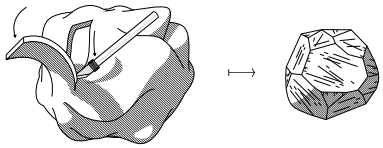
- Design a common data schema for transactional data from PA systems
- Transform data from different systems (ETL Pentaho)
- Create a data warehouse with dimensional modeling
- Connect the DW to Pentaho BI

Impact & Potential for Collaboration

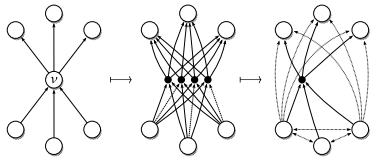
- Improve assessment of students & learning gains
- Improve review of scientific literature
- Apply research to assessment of products or employees

NC STATE UNIVERSITY

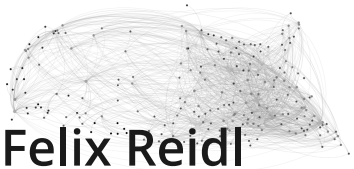
Structural Sparseness & Complex Networks



Algorithms



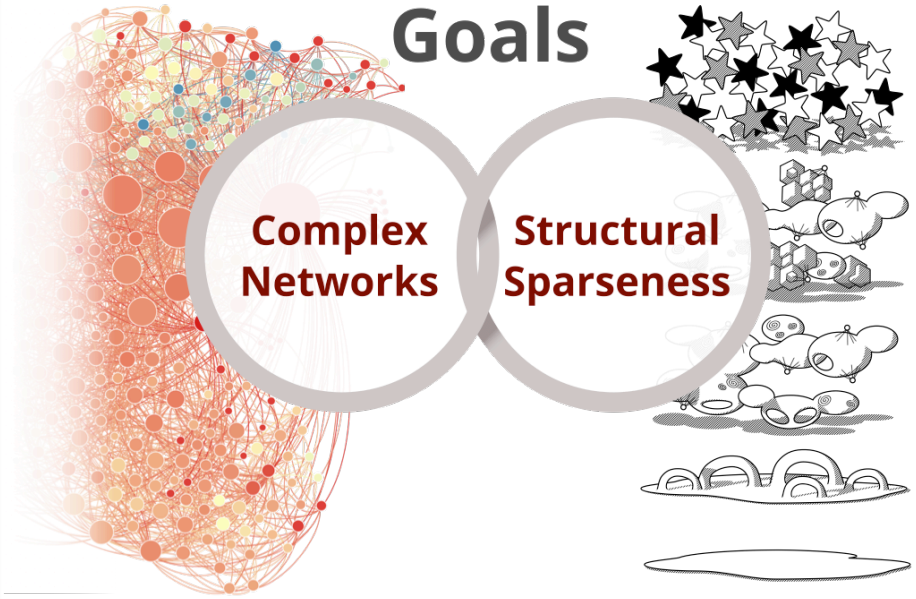
Graphs



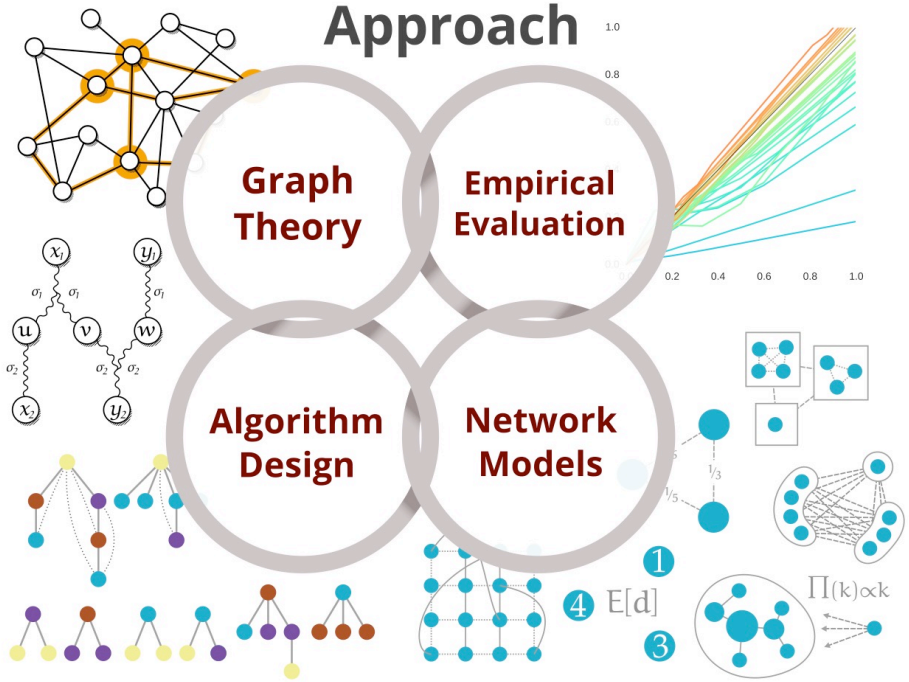
Networks

Felix Reidl
Computer Science

Goals



Approach



Impact and Potential for Collaboration

We design fast algorithms for real-world problems, exploiting structural sparseness.

If you have **network data** and need to solve a **computationally hard problem**,

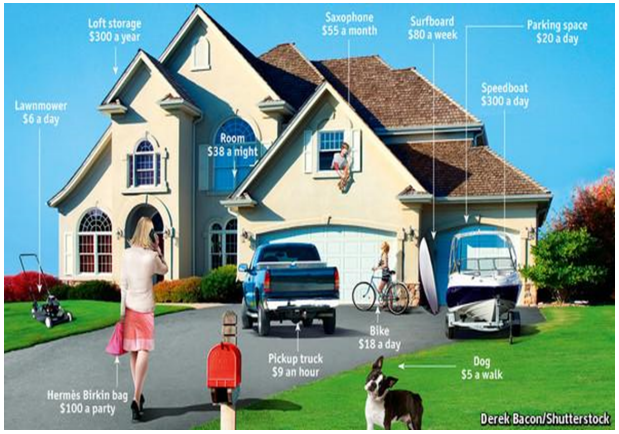
get in touch!

Theory in Practice

csc.ncsu.edu/faculty/bdsullivan

NC STATE UNIVERSITY

Trust in the Sharing Economy



Name: Rosanna Garcia, PhD

Department: Poole College of Management

Goals

- Build a model of interpersonal trust, which is personal trust arising typically from communication between two individuals, within e-commerce domain.

Approach

- Survey with Sharing Economy Users
- Web data mining & NLP of online presence/sentiment analysis
- Develop predictive model
- Test results

Impact & Potential for Collaboration

- Big data mining
- NLP
- Sentiment analysis
- Machine Learning
- Adding consumer behavior to predictive analytics

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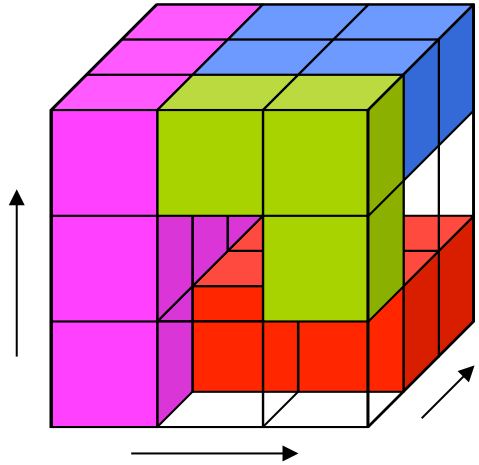
Customer Portfolio Management



Name: Thomas Hollmann
Department: Marketing (Poole COM)

Goals

Improve Strategy and MarketingTactics

Approach

Segmentation by
Lifetime Value vs Profit Curve
Tenure
Strategy Fit

Impact & Potential for Collaboration

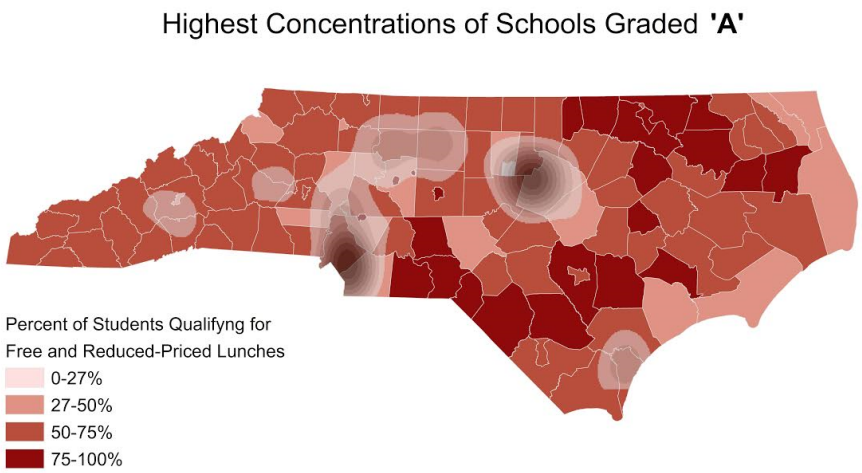
Impact: ROE 8 to 20 in 5 years

Collab:
Industry Application
Paper

Break

NC STATE UNIVERSITY

Visualizing State Education Data to Engage the Public



Name: Emily Antoszyk & Trip Stallings
Department: Friday Institute, College of Ed

Goals

- Use data visualizations to offer new, innovative, and meaningful ways to present large-scale education data to the general public
- Engage the public in deeper discussions of important education issues

Approach

- Apply data visualization techniques to various ed. data sources (e.g., NC Teacher Working Conditions Survey, School Report Cards, etc.)
- Products: static visualizations, real-time adaptable images, interactive products that can be manipulated by outside stakeholders
- Web presence: *Consider It Mapped*

Impact & Potential for Collaboration

- By publishing maps on EdNC.org—an online portal for reporting on education issues in North Carolina—*Consider It Mapped* reaches thousands of readers monthly
- *Consider It Mapped* is in discussions with other orgs. and NCSU departments to team up on future data visualizations

NC STATE UNIVERSITY

Impacts of Extreme Events on Health

Extreme Events

-Socioeconomic

-Behavioral

-Environmental

-Societal

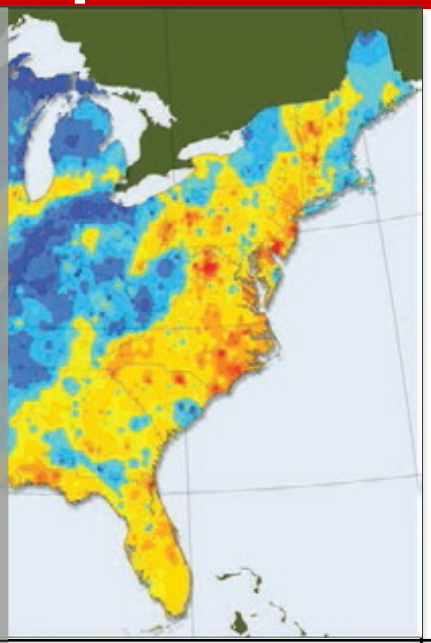
Exposure Pathways

Health Outcomes

Response Plan

Societal, Healthcare, Business, Personal, Economic

Resilience



Goals

A more responsive & resilient society.

How can health outcomes can be impacted directly or through cumulative, compounding, or secondary effects of extreme events?

- Reduced access to or disruption of healthcare services
- Damages to and cascading failures of infrastructure

Approach

GIS, Spatial analysis, decision science

Ecogeographic epidemiology

geographically referenced data on disease, environment, landscape and genetics to better understand the multifactorial basis of human health outcomes

Develop a quantitative framework to base probability and likelihood estimates of increasing exposure to health hazards

Cascading decision tree valuation

Foray into Genetic GIS Analysis & Population Migration

Impact & Potential for Collaboration

No published, national-scale, quantitative projections of changes in exposure risks for extreme events exists.

-Multi-Criteria Decision Analysis

-Data Fusion & Sampling ?s

-Uncertainty Quantification

-Economic Valuation

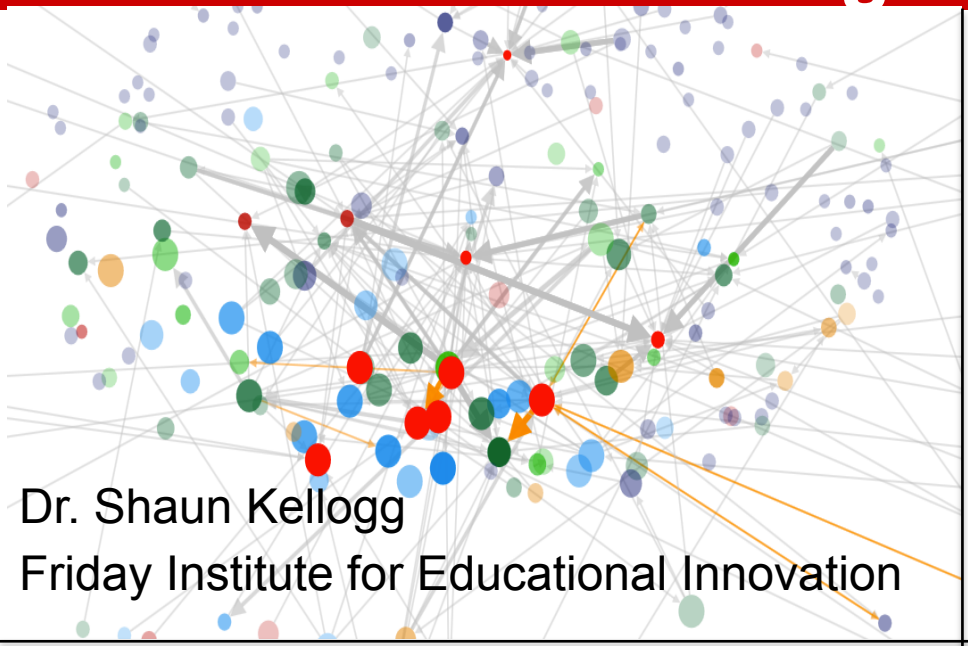
-Visualization

Dr. Paula Hennon, NCICS

Dr. Jen Runkle, NCICS & CHHE

NC STATE UNIVERSITY

Learning Analytics & Evaluation



Dr. Shaun Kellogg
Friday Institute for Educational Innovation

Goals

Our goal is to more effectively leverage Data Science techniques such as Text Analysis and Machine Learning to support the implementation and impact of K-12 programs.

Approach

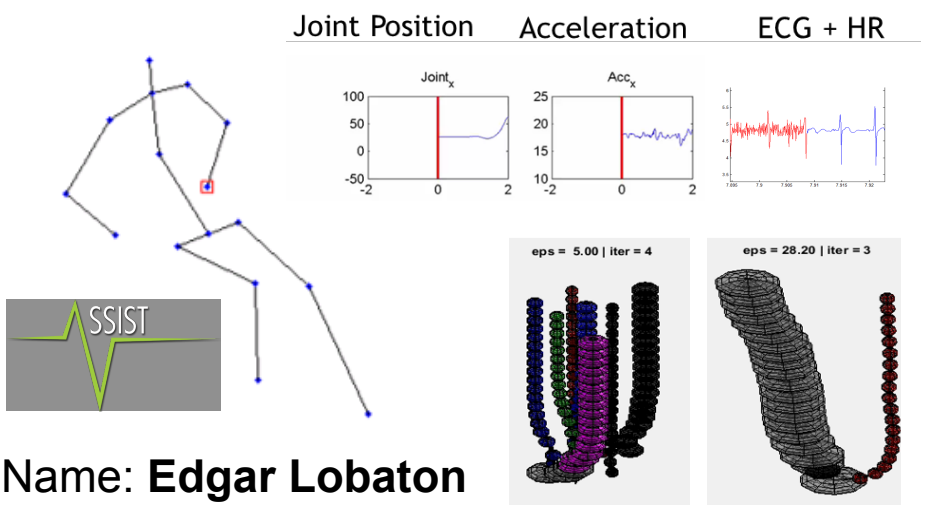
We are currently integrating Learning Analytics techniques including Data Dashboards and Social Network Analysis to support more traditional evaluation approaches.

Impact & Potential for Collaboration

Our work provides a unique opportunity for collaboration to optimize learning and environments in which it occurs. Specifically, we are interested in efficient ways for mining text to inform teaching and learning.

NC STATE UNIVERSITY

ASSIST Wearable Data Processing



Name: **Edgar Lobaton**

Department: Electrical and Computer Engr.

Goals

Characterize the effect of motion and muscle activation artifacts in ECG devices using dry and wet electrodes.

Minimize energy consumption while maintaining a desired level of accuracy for estimation of respiratory rate

Approach

Collect multimodal data under different activity conditions

Develop change point detection techniques for artifact detection

Hierarchical Characterization of the space of activities using topological and statistical data analysis techniques

Impact & Potential for Collaboration

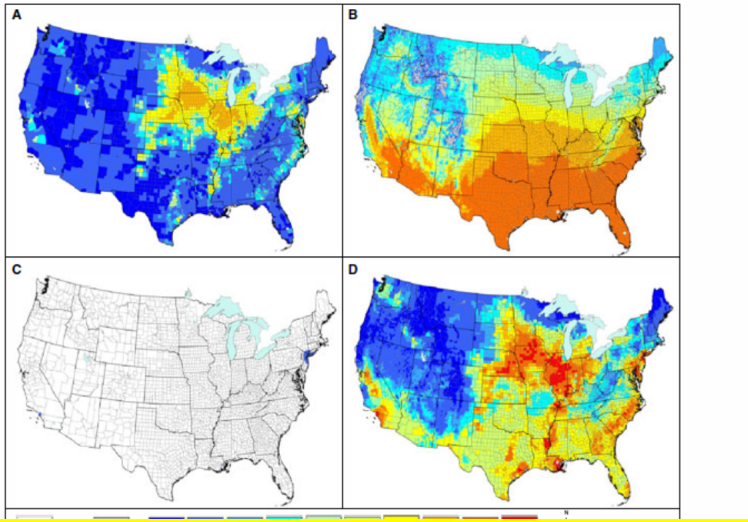
The ASSIST devices will continuously monitor human physiology and environmental factors

New techniques need to be developed to process the large amount of data to be produced

There are a number studies that can benefit from these platforms

NC STATE UNIVERSITY

Title: NSF/NCSU Center for Integrated Pest Management



Name: Frank Louws; Director
Department: NSF/NCSU Center for Integrated Pest Management

Goals

- foster the integration of science, information systems and practices
- to reduce damage and losses due to pests (insects, pathogens, weeds, other fauna)
- in agricultural, urban and natural settings
- at the state, regional, national and international levels.

Approach

Protect our borders. Manage, develop and deploy information systems that support critical objectives of the USDA, states and foreign cooperators to prevent introduction of invasive pests.

Promote National Food Security. 1) Provide leadership to secure funding and work with partners to implement National IPM programs. 2) Design and manage national databases of IPM programs, outcomes and products.

Lead state-wide extension IPM outcomes and advance CALS/NC State goals. House the State IPM Coordinator and provide primary leadership to secure competitive funds through the Extension IPM program

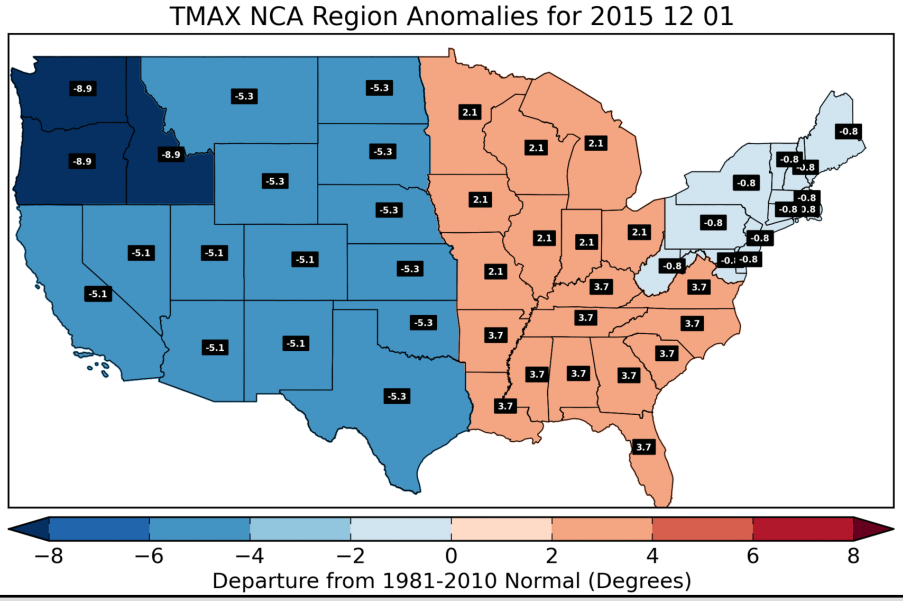
Impact & Potential for Collaboration

IMPACT: Limit damage due to pests to promote economic, environmental and human health benefits

1) CIPM has strong links with major stakeholders and funding agencies to advance IPM programs that are data-dependent;
2) CIPM has superior capacity to engage collaborates to develop and manage large projects (e.g. less than 1M to over $6.8M);
3) CIPM generates about $5.2 million in external funds/yr and links with many partners to advance Regional, National and International pest management goals.

NC STATE UNIVERSITY

Analyze the State of the Climate on a Daily Scale



Goals

- Provide near real time climate analysis on the daily and weekly scale.
- Inform stakeholders about recent and past events in the climate context.
- Generate visualizations that are scientific, yet informative to the general public.

Approach

- Setup for nightly ingest, quality control, and product generation.
- Account for non-climatic influences in temperature record, including station moves, instrument changes, etc.
- Build website to display products for public monitoring and analysis.

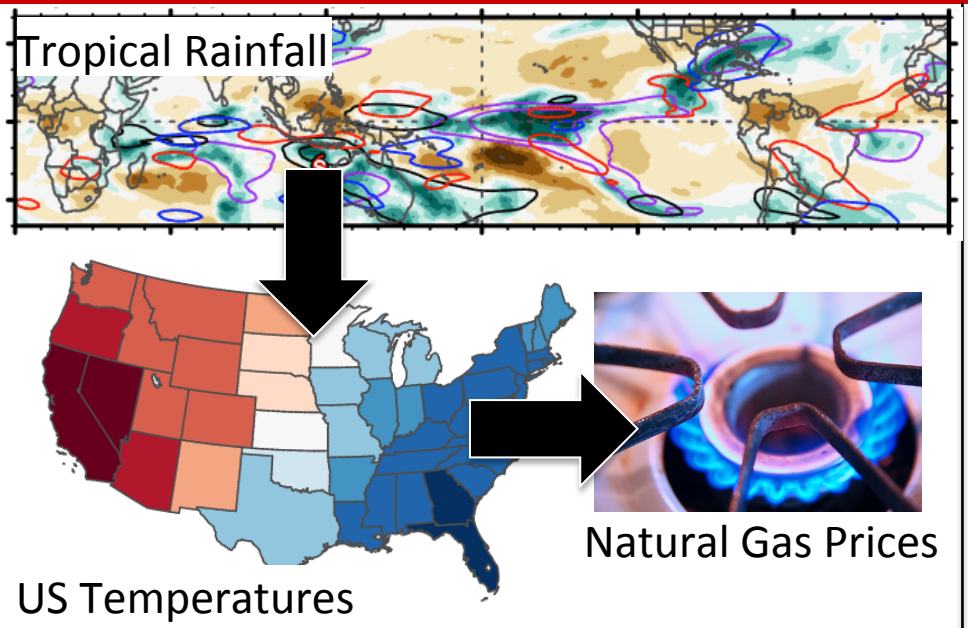
Impact & Potential for Collaboration

- Geospatial and statistical analysis.
- Visualizations, including GIS.
- Communication and outreach.
- Public feedback.

Jared Rennie
North Carolina Institute for Climate Studies
jared@ncics.org
http://monitor.cicsnc.org/sub

NC STATE UNIVERSITY

Rainfall and Energy



Goals

1. Identify features in noisy tropical rainfall
2. Relate those features to changes in US temperatures 2–4 weeks later
   - *Or changes in the forecast models?*
3. Relate those changes to changes in commodity prices

Approach

1. Fourier filtering or EOFs
2. Composites, correlations, regression, neural networks, etc.
3. Work with traders or industry meteorologists

Impact & Potential for Collaboration

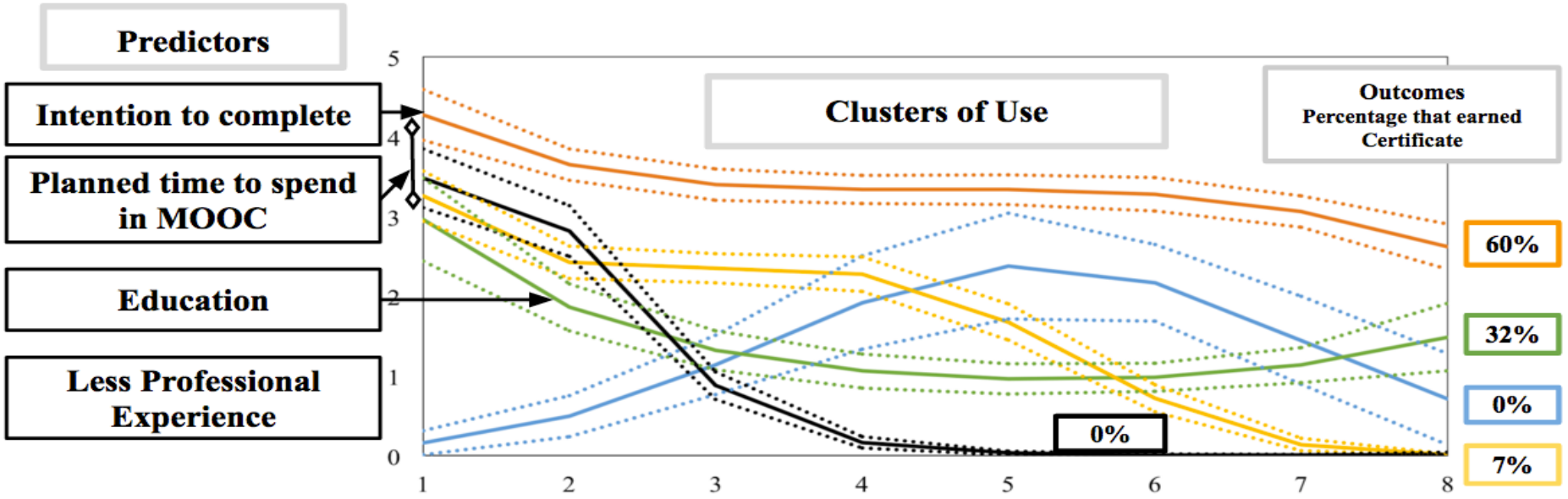
- Smarter algorithms
- Linear Inverse Modeling?
- Financial experts?

Carl Schreck
NC Inst. for Clim. Studies

NC STATE UNIVERSITY

Behavior in MOOCs

by Isaac Thompson



Goals

- Apply psychological theories to new new paradigm of MOOCs
- To uncover patterns of use in MOOCSs
- To find predictors and consequences of use patterns

Approach

- Data mine log trace data
- Latent Growth Curve Analysis
- Time-stable covariates and outcomes

Impact

- Furthers (a) MOOC delivery methods, (b) educational and psychological theories, (c) measurement science (i.e. data science).

Potential for Collaboration

- Partner to create interventions based on data
- Partner to further methods of measurement

THE WILLIAM & IDA FRIDAY INSTITUTE FOR EDUCATIONAL INNOVATION

NC STATE UNIVERSITY

Using State Data for Education Policy Analysis

Table C1. Demonstration of proficiency on End-of-Course re-take, all subjects combined, 2008–2012

	Odds ratio	Standard error	Significance
NCVPS credit recovery student	0.6119004	0.0272836	***
1st test scaled score	1.19199	0.0017074	***
Limited English proficiency	0.4919903	0.016952	***
Free/reduced-price lunch	0.8822441	0.0125376	***
Black	0.5567789	0.0086354	***
Hispanic	0.9944044	0.027997	
Asian	0.9513022	0.063193	
Native American	0.6381916	0.0432566	***
Pacific Islander	0.9499305	0.4351335	
Multi-race	0.8795567	0.0363032	**
Exceptional	0.5454756	0.0097106	***
Rural	0.9559118	0.0129688	***
Female	0.9012885	0.0119991	***
Grade	1.091217	0.00678	***
Attendance	1.005749	0.0003209	***
Year	0.9944992	0.0060208	

* Significant at p < .05, ** Significant at p < .01, *** Significant at p < .001, <blank> = Not statistically significant

End-of-Course is the North Carolina End-of-Course Examination

Note: Number of cases (course records) = 125,560; students only re-take if they do not reach proficiency on 1st test

Source: Authors' analysis of administrative data provided by the Education Research Data Center.

Name: Sara Weiss & Trip Stallings
Department: Friday Institute, College of Ed

Goals

- Use statewide, longitudinal data to inform policy discussions about best practices for reducing dropout
- Generate stakeholder discussions about the appropriate role for online learning in dropout prevention

Approach

- Compare short- and longer-term academic outcomes across dropout prevention options (summer school, course repetition, online CR)
- Generate OLS and logistic analyses of outcomes for student groups to inform future work

Impact & Potential for Collaboration

- Impact TBD – report to be released later this Spring
- Collaborated with NCVPS, Department of Public Instruction, and REL-SE at Florida State; willing and able to collaborate with others interested in online and dropout prevention