



## CHAIRMAN'S CORNER

Professor Nur Yazdani



Welcome to the Fall 2011 issue of CE Times! The Civil Engineering Department is continuing its momentum towards overall expansion in quality and quantity. Student enrollments continue to be at record levels. Sponsored research activity continues to increase at an excellent rate. New faculty and research space have been acquired, and new research initiatives in critical areas are being established. With the state budget reductions already addressed, we are looking towards updating

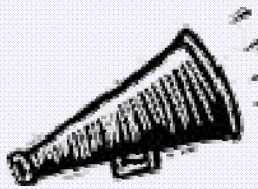
the department strategic plan to get us to the next level. I invite you to browse through this newsletter and contact me if you have any questions.

FALL 2011

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### ATTENTION CIVIL ENGINEERING ALUMNI!



We love hearing from you and would like to include your story in our next newsletter! We want to know about your latest accomplishments, promotions, family news, and/or any events that you may be attending or organizing. We are proud of all of our alumni and know that you are doing great things so let us hear about it!

Please email Sara Ridenour ([ridenour@uta.edu](mailto:ridenour@uta.edu)) any news that you would like to share. Thank you!

# FACULTY NEWS AND EVENTS

## Faculty Awards and Distinctions

### DR. TSENG HUANG ENDOWED PROFESSHIP AWARDED TO DR. ALI ABOLMAALI



**Dr. Ali Abolmaali** has been recently awarded the Dr. Tseng Huang Endowed Professorship. The award is a fitting tribute to the significant achievements made by Dr. Abolmaali in the areas of structural mechanics and structural engineering. The award was established in honor of Dr. Tseng Huang (deceased) by his supporters and admirers, who was a long time faculty member in the Civil Engineering department and who made significant contributions as a researcher and scholar in structural mechanics.



Assistant Professor **Shih-Ho Chao** was awarded the American Institute of Steel Construction (AISC) Milek Fellowship for his research on "Quantification of Seismic Performance Factors for Steel Staggered Truss and Eccentrically Braced Framing Systems." The AISC Milek Faculty Fellowship is awarded to talented faculty to encourage innovation in structural steel design and construction. This award was named after William A. Milek, former AISC Vice President of Engineering and Research, to recognize his invaluable contributions to AISC and the structural steel industry as a whole. The Milek Fellowship is a four-year, \$30,000 per year award and is designed to contribute to the research careers of beginning faculty who teach and conduct research investigations related to structural steel while producing research results beneficial to designers, fabricators, and erectors of structural steel. The award was presented to Dr. Chao by Mr. Tom Schlafly, AISC Director of Research, at the 2011 North American Steel Construction Conference (NASCC) on May 13 in Pittsburgh.

Assistant Professor **Hyeok Choi** received the US Environmental Protection Agency (EPA)'s Scientific and Technological Achievement Award for his research on the remediation of sediments contaminated with toxic and persistent polychlorinated biphenyls (PCBs). His research and related publications were evaluated by a subcommittee of the EPA's Science Advisory Board and recommended for Level III recognition in the category of Risk Management and Ecosystem Restoration. His research team, for the first time, demonstrated a possibility of in situ cleanup of the EPA's Superfund sites contaminated with PCBs using nanomaterials. In fact, the research was highlighted in scientific news and media due to its scientific significance and practical application potential. Dr. Choi is currently collaborating with researchers in the National Risk Management Research Laboratory of EPA.



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# FACULTY NEWS AND EVENTS

## Faculty Presentations, Conferences, and Activities



**Dr. Yvette Pearson Weather-ton** delivered four presentations at the Annual Conference of the American Society for Engineering Education (ASEE) in Vancouver, British Columbia in June 2011. The presentations covered a wide range of engineering education topics related to her work on projects funded by the National Science Foundation (NSF). The topics included mathematics performance and first-year reten-

tion, efforts to infuse the civil engineering curriculum with sustainability and perspectives on why women, minorities and people with disabilities remain underrepresented in engineering. One paper also examined the benefits of kinesthetic and computational modeling in high school chemistry courses. All of the papers were published in the ASEE Conference Proceedings and are available online at [www.asee.org](http://www.asee.org). Co-authors include faculty from the Colleges of Engineering and Education, an undergraduate civil engineering student, and a high school chemistry teacher.



Senior Lecturer **Dr. Mostafa Ghandehari** published a joint paper on traffic flow theory and made a conference presentation on construction scheduling. Publication was a joint work with Dr. Sia Ardekani and graduate student S. Nepal. The title of the published paper is "Macroscopic Speed-Flow Models for Characterization of Freeway and Managed Lanes" which appeared in Buletinul Institutului Politehnic Din Lasi, Vol LVII(LXI), No.1, 2011, pp149-159. The presentation at the meeting of the American Mathematical Society in April, 2011 in Las Vegas was titled "Triangular Distribution For Scheduling of Construction" and was a joint work with graduate students P. Hajyalikhani and Z. Niazi.

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**Dr. Anand Puppala** recently attended American Society of Civil Engineers' National Committee on Sustainability (COS) meeting held at Marriott Hotel in Memphis, Tennessee on October 22 and 23rd of 2011. Dr. Puppala is serving as an associate member of this esteemed committee which is focusing on several sustainability infrastructure initiatives. Dr. Puppala represents the geotechnical area of the Civil Engineering in this committee. Currently he has also been involved in the activities of a subcommittee on "Sustainable Infrastructure Certification." He may get involved in a few other subcommittees that focus on communication, certification and sustainable infrastructure education issues. This March, Dr. Puppala received the invitation to serve as a Vice Chair of a new ASCE-Geo Institute (G-I)'s standing committee on Sustainability Engineering Practices. This is a new committee and will serve as a focal point for G-I's technical committees regarding sustainable engineering practice initiatives and topics.

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### SUPPORT THE CE DEPARTMENT!

Your gift could help students otherwise unable to attend, create a professorship, or provide valuable equipment for research and teaching!

Please contact Dr. Nur Yazdani, CE Chair, for additional details.

# FACULTY NEWS AND EVENTS

## Faculty Research Projects

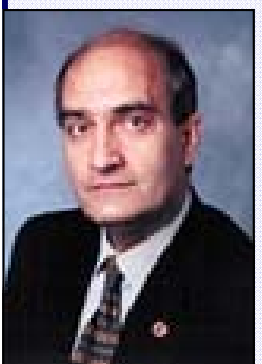


Assistant Professor **John McEnery** has received a one-year \$99,764 research grant to conduct Nonlinear Three Dimensional Finite Element Analyses of the Brazos River in Fort Bend County, Texas. This project will develop a detailed predictive model of decadal changes in channel morphology along the Brazos River down-

stream of the Allens Creek confluence. Behavior of the channel geometry and bar formation will be examined with a coupled approach. Hydraulic modeling of sediment transport will be combined with stratigraphic assessment to produce a geomorphic analysis of changing channel conditions over both a near term and extended temporal range.

State-of-the-art three dimensional finite element analyses will be developed using the hydraulic modeling program ADH (Adaptive Hydraulics, U.S. Army Corps of Engineers, 2010). The program uses a dynamically adaptive finite element mesh to solve velocity field calculations for channel geometries including structures and improvements such as fish passages (Gambucci, 2009). In addition to solution of the St. Venant equations for flow, a computational scheme has also been devel-

oped to model cohesionless sediment transport (Brown and Tate 2009). ADH includes provisions to estimate bed movement and reconfiguration in movable bed systems. A substrate map and data related to bed and bank material and sediment input to the reach will be created from data collected in the field. Results of the ADH hydraulic model using 2001 bathymetric data will then be used together with the field data to predict how the 2001 physical channel and habitat would be expected to change over time. Predictions of potential change will be made in a qualitative sense based on hydraulic flow patterns visible in the hydraulic model output at various flow rates. In addition, the ability of the ADH model to predict channel change will be tested by running the model in combination with the hydrologic record available from USGS gage data for the period December 2001 to July 2011.



The following commentary from **Dr. Mohammad Najafi** recently appeared on NYTimes.com and is reprinted with permission. Pipelines are one of the safest modes of transportation. However, as with any other constructed infrastructure, they need to be properly installed and maintained. Underground pipelines tend to be out of sight and out of mind. Sometimes the owners and operators do not follow the best construction and asset management practices. While new technologies are available for inspection and real-time monitoring of pipelines, they require advanced planning and additional investment and operational costs. Lack of proper inspection and monitoring, especially for oil and gas pipelines, may result in catastrophic failures, damage the environment and injure or kill people. Since no technology is risk-free, the best way to avoid pipeline system failures is to avoid the extraction of oil from the sensitive Alberta wilderness. We should instead use more renewable energy sources and encourage the conservation of fossil fuel.

# RESEARCH NEWS

## Faculty Research Projects



**Professor Abolmaali** has received a one-year \$117,635 research grant to conduct Nonlinear Three Dimensional Finite Element Analyses for the Integrated Pipeline Project (IPL) from the Tarrant Regional Water District and Dallas Water Utility. The IPL project includes 150 miles pressure pipelines

from Lake Palestine to Dallas Fort Worth. The research will develop a high fidelity and highly robust nonlinear three-dimensional (3D) Finite Element Model (FEM) for steel pipe and American Water Works Association Specifications C-301 pre-stressed concrete cylinder pipe (PCCP) that can be used to predict pipe performance under varying backfill and loading conditions to be identified by the IPL design team. The FEM analyses algorithm will consider material, geometric, and contact nonlinearities. The material non-linearity will consist of elasto-plastic and tension-stiffening constitutive law for steel and PCCP, respectively. For soil, both short-term and long-term material prop-

erties will be considered. Material models such as Drucker-Prager, Mohr-Coulomb, Selig Hyperbolic, and others will be considered for optimum performance. The geometric non-linearity will include the large deformation analysis for soil and steel pipe materials which will be based on the Almansi (Eulerian) strain that yields to the Cauchy stress tensor from which the total Lagrangian algorithm will be employed. The implementation of large deformation algorithm will ensure that the deformation of the soil and pipe are accurately simulated. Finally, the contact nonlinearity will include the contact elements at the interface between the pipe and soil and different soil layers during sequential layered construction. Several different contact algorithms such as surface-to-surface and node-to-surface will be implemented for model optimization. Displacement-control analysis algorithm will be employed to eliminate potential errors resulting from discontinuities in material constitutive law such as C0 type curves resulting from elasto-plastic response of steel materials or bilinear response of concrete and steel cylinder in tension stiffening model.

**Dr. Shih-Ho Chao** and **Dr. Nur Yazdani** received a three-year research grant of \$413,142 from the Texas Department of Transportation. The objective of this project is to determine if adequate horizontal shear capacity is provided by the 5-inch concrete deck on slab and box beams, despite lack of reinforcement development. Horizontal cracks between the precast beams and the cast-in-place decks were noticed in several TxDOT bridges. Those cracks could be due to stresses induced by shrinkage or shear forces. In any case, this shows that that current TxDOT details might not provide sufficient horizontal shear resistance in those members. First phase of this project involves small scale tests to investigate the three major components of horizontal shear resistance: (1) cohesion and/or aggregate interlock, (2) friction between the crack faces, and (3) dowel action of the reinforcement. A simple bar

pullout test will also be used to evaluate the influence of the bend curvature on the bond and slip characteristics of the horizontal shear reinforcement. Alternative details for surface roughness and bar geometries will be investigated. In the second phase of this project, the research team will be testing several full-scale composite box and slab beams with current and proposed alternative details to investigate the overall composite behavior.



# RESEARCH NEWS

## Faculty Research Projects



**Drs. Mattingly and Ardekani** received a TxDOT grant to examine the use of existing public right-of-ways for high-speed rail construction in Texas. The pri-

mary purpose of this research is to determine if and how existing TxDOT right-of-way (ROW) in conjunction with current public, utility and freight rail ROW can potentially accommodate high-speed intercity passenger rail (HSIPR) and/or dedicated freight transportation systems. To answer the research question for Texas, all potential ROW routes in Texas will be identified and their key characteristics (technical, political, and legal feasibility) considered for utilization by a spectrum of HSIPR and dedicated

freight systems. For those four case studies, the study will develop potential solutions to engineering challenges encountered in the ROW, such as highway interchanges and narrow ROW width. Finally, the study will produce a guidebook for the use of TxDOT ROW for HSIPR and dedicated freight systems. Dr. Ardekani received a NCTCOG grant to develop a transportation sustainability index for urban developments in Texas. This project entails development of a methodology to characterize and quantify the degree of sustainability of the transportation system in a city or an urban development. The project objectives are to identify key indicators of transportation sustainability and to integrate them into an overall transportation sustainability index. If successful, such an index may then be used to compare one urban development to another in terms of their degrees of sustainability or be utilized as a means of conducting a sustainability audit for a given development.



The Texas Department of Transportation (TxDOT) has awarded a two-year \$538,304 grant to **Dr. Sahadat Hossain** to implement new slope stabilization methods for the Dallas District. The project will be starting from September 2011 and will continue until August 2013. After successfully implementing the slope stabilization

using Recycled Plastic Pins (RPP) at US 287, the same slope stabilization methods will be utilized at two more sites at varying soil content and different locations around the Dallas District.



### RESEARCH STAFF ANNOUNCEMENT



**Terrie Davis** recently joined the Civil Engineering Department as the Administrative Assistant for Research. Terrie transferred from the Nursing Department and has worked on campus for over five years.

### COLLEGE OF ENGINEERING SPEAKER SERIES

Cathy Leslie, Ph.D., P.E., President, Engineers Without Borders—USA, gave a presentation for the COE Speaker Series in October. Ms. Leslie assumed the role of Executive Director of Engineers Without Borders-USA in March 2008. Ms. Leslie's presentation was titled, "EWB-USA's Commitment to Equity, Economy, and Ecology."

## SPOTLIGHT ON NEW FACULTY



**Andreas Stavridis, Assistant Professor**

Dr. Stavridis graduated from the University of California at San Diego. His research interests include the seismic design of structures, large-scale static and dynamic testing of structures and non-structural elements, analysis and design of concrete and masonry structures, micro-and macro-modeling of structures, and the retrofitting of existing structures.



**Xinbao Yu, Assistant Professor**

A graduate of Case Western Reserve University, Dr. Yu's areas of research include sensor technology for sustainable infrastructure, geophysical instrumentations, deep foundations, and computation geomechanics.

## DEPARTMENT NEWS



A retirement reception was held to honor **Dr. John H. Matthys** on Saturday, September 17, 2011 at

Walnut Creek Country Club. Dr. Matthys began his career at the University of Texas at Arlington in 1974 and continued his loyalty and service to the Civil Engineering Department for 37 years. As a Professor in the Structures Area of Civil Engineering, Dr. Matthys graduated five Ph.D. students and ten Master's students. Dr. Matthys is a Past President and Vice-President of The Masonry Society and has edited six books in the area of Masonry. He has also given 104 technical lectures or presen-

tations, participated in 72 research reports, and given 13 scholarly paper presentations. Dr. Matthys has received 16 professional awards and was appointed the Dr. Tseng Huang Endowed Professor in 2009. Dr. Matthys is also the Director of the Construction Research Center, which hosts the Building Professional Institute (BPI). BPI began in 1992 and has grown from 250 attendees to 1,600 attendees. As shown by the overwhelming gratitude and support at the retirement reception, Dr. Matthys touched many people and his legacy will always have a special place in the department.



## DEPARTMENT NEWS



**Center for Underground Infrastructure Research and Education (CUIRE)**, China University of Geosciences Wuhan, and The American Society of Civil Engineers (ASCE) joined forces to hold the second International Conference of Pipelines and Trenchless Technology (ICPTT 2011). The conference, cosponsored by China-U.S. Joint Center for Trenchless Research & Development (CTRDR), was held from October 26th through 29th, 2011, at the National Convention Center in Beijing, China. The conference provided a world forum for 80 oral presentations and poster discussions of 253 papers published in the ICPTT 2009 Proceedings and additional papers to be published at the ASCE Journal of Pipeline Systems Engineering and Practice. The conference theme was "Sustainable Solutions for Water, Sewer, Gas and Oil Pipelines." ICPTT 2011 was a resounding success with more

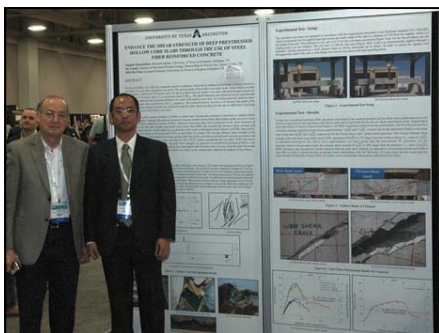
than 540 participants from various countries including the United States, Canada, UK, Germany, Korea, India, Iran, Japan, Egypt, New Zealand and China. The exposition held 33 exhibitors of heavy construction equipment, and services. Beijing Longkexing Trenchless Engineering Co., Ltd, Bala Prima Equipment Co., Ltd and Xiamen Xinyongtong Trenchless Technology Co., Ltd sponsored ICPTT 2011. Dr. Mohammed Najafi P.E., CUIRE Director, presented a welcome presentation, and chaired the plenary session on the first day of the conference. Additionally, he presented two technical papers and also presented a one-day workshop on New Pipeline and Trenchless Technology Advances. More than 60 pipeline professionals attended this educational workshop.



### STUDENT ORGANIZATION NEWS

The University of Texas at Arlington is proud to introduce our new student chapter of **SAME (Society of American Military Engineers)**. The Charter was received from the SAME Fort Worth Post in October. There are 11 students who have signed up to become Student Chapter members. **Dr. John McEnery** is the inaugural Faculty Advisor of the Chapter.

# STUDENT NEWS



**Sanputt Si-masathien**, Ph.D. student in structural engineering, presented his poster at the 2011 PCI 57th Convention and National Bridge Confer-

ence in Salt Lake City, Utah, during October 22nd - 26th, 2011. Sanputt attended the conference and presented his research work in prestressed concrete supervised by research professor Joe Lundy and Dr. Shih-Ho Chao. The poster, titled "Enhance the Shear Strength of Deep Prestressed Hollow Core Slabs Through the Use of Steel Fiber Reinforced Concrete," won the Travel Award Competition for the Student Research Poster Session conducted by the PCI Student Education Committee. Standing next to him in the picture is the 2011 PCI Distinguished Educator Award winner, Dr. Antoine E. Naaman from the University of Michigan.

Transportation graduate student, **Bahareh Bakhtiari**, had a poster presentation at the Texas District of the Institute of Transportation Engineers (TexITE) meeting in Garland, Texas on the 15th and 16th of September 2011. Attending students are shown in the photo, and Bahareh is the fourth from the left.



**Prince Nfodzo**, Ph.D. student under supervision of Dr. Choi received 2011 Texas Water Resources Institute (TWRI) Graduate Student Program Grant supported by U.S. Geological Survey (USGS) for his study on polychlorinated biphenyls (PCBs) cleanup in the Trinity River in North Texas. Based on a state study by the Texas Commission on Environmental Quality, Dallas Morning News reported on February 4, 2010 that fish in the Trinity River located in the North Texas will not be safe for people to eat until the levels of PCBs in the river come down by more than half. Mr. Nfodzo will develop an innovative strategy for in situ remediation of the Trinity River Sediment

contaminated with PCBs using nanomaterials. The USGS through TWRI will sponsor \$5,000 and UT-Arlington will match with \$10,319. Dr. Choi says the funding is small, but enough to initiate such an important research activity at UT-Arlington to contribute to the associated local communities. Nfodzo and Choi published a paper in Environmental Engineering Science in August 2011 for their finding that sulfate radicals are effective to decompose pharmaceuticals and personal care products (PPCPs). Some environmental contaminants in PPCPs have been classified as emerging chemicals of concern and endocrine disrupting compounds. Most of researchers have been using hydroxyl radicals as a strong oxidant for the decomposition of PPCPs while Dr. Choi's research team, for the first time, demonstrated that sulfate radicals-based advanced oxidation technologies are also promising as a new environmental risk management option for PPCPs-contaminated water.

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## STUDENT NEWS

Ph.D. student **Richa Karanjekar** received the prestigious national Richard Stessel Memorial Scholarship from the Air & Waste Management Association (\$2300), as well as a \$5000 national scholarship from the Solid Waste Association of North America.

Ph.D. student **Roja Haritha Gangupomu** was chosen this summer for one of the very competitive Mickey Leland Internships with the Texas Commission on Environmental Quality.

Ph.D. student **Sulak Sumitsawan's** dissertation research was published in the highly ranked journal Environmental Science & Technology. The article title is "Plasma Surface Modified TiO<sub>2</sub> Nanoparticles: Improved Photocatalytic Oxidation of Gaseous m-Xylene."

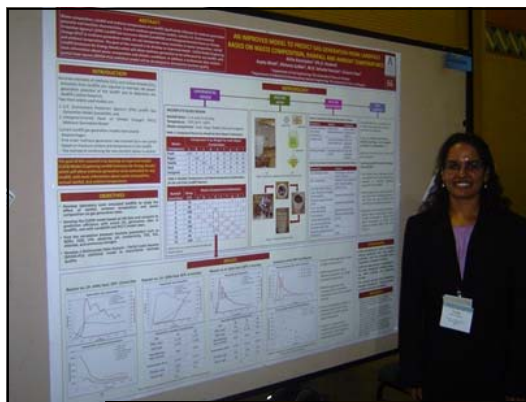
- **Roja Haritha Gangupomu** - "Analysis and Comparison of Inertinite-Derived Adsorbent with Conventional Adsorbents"
- **Annaprabha Athappan** "Adsorption Curve Fits for Landfill VOCs on Bituminous Coal Based and Coconut Shell Based Activated Carbon"
- **Sulak Sumitsawan** - "Role of Moisture in Photocatalytic Oxidation of m-Xylene on Plasma Modified and Standard TiO<sub>2</sub>"
- **Shankar Vaidhyathan** - "Air Pollution Impacts of University Chemistry Labs: A Case Study"
- **Arpita Gandhi** - "Comparison of Air Dispersion Modeling Software ISCST3 vs. AERMOD: A Chemical Plant Case Study"
- **Richa Karanjekar** - "An Improved Model to Predict Gas Generation from Landfills based on Waste Composition, Rainfall and Ambient Temperatures"

Richa's poster won 2nd place in the Ph.D. student category at the conference.



Seven graduate students presented papers or posters at the Air & Waste Management Association National Conference, Orlando, FL, in June 2011. Here are the students and paper/poster titles:

- **Ketwalee Kositkanawuth** - "Evaluation of Emissions from Three Alternatives for Producing Crude" and "A Case Study: Estimating Concentration of Hydrogen Sulfide Gas from Landfill A by Using AERMOD"



## ALUMNI NEWS



Wier & Associates, Inc. is pleased to announce that **Carlo Silvestri, P.E.**, a Principal and Vice President, was chosen as one of this year's Fort Worth Business Press "Forty Under Forty." Carlo was honored at the Fort Worth Business Press annual Forty Under Forty event held at the Fort Worth Club. For each of the past 16 years, the Fort Worth Business Press has honored 40 individuals under

the age of 40 for their professional achievements and contributions to the community. Carlo began working at Wier & Associates as an intern while studying civil engineering at UTA. He is active in the DFW Mid-Cities chapter of TSPE and the UTA chapter of Chi Epsilon. Carlo also participates in the Indian Princess program with his two daughters. Ron Ramirez, P.E., a fellow Principal and Vice President of the firm, says Carlo "consistently fosters excellence by continually enriching his community and family, maintaining his values and integrity and keeping them foremost in his daily and family activities."



**Dr. Benjamin Afotey**, who received his Ph.D. in environmental engineering in 2008, was appointed as a Lecturer in the Department of Chemical Engineering at his undergraduate alma mater, Kwame Nkrumah University of Science and Technology in Kumasi, Ghana. He teaches courses in

Physical Chemistry for Chemical Engineers, Environmental Technology, and Strength of Materials.



## STAFF NEWS



Civil Engineering Administrative Assistant, **Sara Ridenour**, recently had an article published in *Fast Capitalism*, an academic journal including work in the social sciences, cultural studies, and humanities. Sara's article, *Facebook Killed the Reunion Star: How Facebook is Changing Who We Are and What We Do*, focuses on the vast impact Facebook has on our culture and society, specifically involving our relationships. Sara is currently a graduate student in the Department of Sociology at UT Arlington; she also earned her BA, summa cum laude, in sociology from UT Arlington. Her research interests include media/cultural studies and gender. Sara's article is available on-line at [www.fastcapitalism.com](http://www.fastcapitalism.com) and is in Issue 8.1.