Bio-Sketch of Gianluca Cusatis

Gianluca Cusatis is a faculty member of the Civil and Environmental Engineering Department at Northwestern University that he joined in August 2011. He teaches undergraduate and graduate courses of the civil engineering curriculum and performs research in the field of computational and applied mechanics, with emphasis on heterogeneous and quasi-brittle materials. His work on constitutive modeling of concrete through the adoption of the so-called Lattice Discrete Particle Model (LDPM), one of the most accurate and reliable approaches to simulate failure of materials experiencing strain-softening, is known worldwide. Under the sponsorship of several agencies (including NSF, ERDC, and NRC) his current research focuses on formulating and validating multiscale and multiphysics computational frameworks for the simulation of large scale problems dealing with a variety of different applications including, but not limited to, infrastructure aging and deterioration, structural resiliency, projectile penetration, and design of blast resistance structures. He is member of IA-FraMCoS, IA-Concreep, ASCE, and ACI and active in several technical committees. He chaired the ACI 446 committee on Fracture Mechanics from 2010 to 2016. He served as treasurer for IA-FraMCoS for the last three years and he is the current president for IA-ConCreep.

Vision Statement

IA-FraMCoS is currently experiencing a generational change: many researchers who founded the organization more than 25 years ago are either retired or close to retirement. Hence, the survival and progress of the organization will rely on young and motivated researchers that will bring within IA-FraMCoS new ideas and renovated energy.

IA-FraMCoS should continue to organize the FraMCoS conference as per its main mission but it should also be active in educating the new generations of engineers on the importance of concrete fracture mechanics in modern civil engineering. Many undergraduate programs around the world still do not cover fracture mechanics topics and more practitioners even ignore its existence. IA-FraMCoS, in collaboration with other institutiona such as ACI, RILEM, etcetera should be organizing events to disseminate the use of fracture mechanics in practical applications.

Gianluca Cusatis, thank to his international leadership experience within several scientific organizations and the fracture mechanics community, is an ideal candidate to a position within the Board of Directors. He has the experience, the energy, and the ideas to take IA-FraMCoS to this new phase.

Marco di Prisco is a full Professor of Structural Design at the Department of Civil and Environmental Engineering, Politecnico di Milano since 2002. His main research topics are constitutive modelling of cement composite materials, reinforcement-concrete interaction basic mechanisms, R/C, P/C and FRC structural elements, prefabricated structures, soil-structure interaction, structural response at exceptional loads, tunnel safety, risk mitigation. Honorary Editor of the *European Journal of Environmental and Civil Engineering*, Associate Editor of the *J. of Cement and Concrete Composites*, member of ACI, fib (co-opted member of Presidium and Deputy member of Italian delegation and member of several Technical Groups), RILEM (expert member of Development Advisory Committee), convener of the CEN Commission TC250/SC2/Wg1/Tg2 to introduce FRC in EC2. Member AICAP and of several National Technical Committees (UNI, CNR, CC.SS.), He is President of the Italian Cultural Association *CTE* on the Industrialization in Building Constructions. Member of many Scientific Committees of International Conferences, He promoted as chairman or co-chairman BEFIB 2004, SACOMATIS 2008, PROTECT 2012 and the 8th edition of CONSEC2016 International Conference (CONcrete under SEvere Conditions-environment & loading). Head of the Department of Structural Engineering since 2009 to 2012, He is now the Coordinator of the Master of Science *Civil Engineering for Risk Mitigation*.

About **FRAMCOS**, I think that a very important job should be done on the understanding of FRC behaviour. because it is not clear how to control fracture energy process after the crack propagation in the matrix, in order to prevent the rising of spurious dissipated energy and to control the propagation in the time. At the same time, I think also that the dynamic process of fracture as well as fatigue and fire behaviour should be topics to better understand, even if some researchers contributed significantly on these topics. Finally, also the role of statistics should be better investigated in order to predict the test behaviour of concrete structures with increasing reliability.

J. M. Chandra Kishen

Dept. of Civil Engineering, Indian Institute of Science, Bangalore 560012, India| chandrak@civil.iisc.ernet.in
Tel: +91-80-2293 3117 / Fax: +91-80-2360 0404 / Cell:+919844601830 / http://civil.iisc.ernet.in/~chandrak/

EDUCATION

1992 - 1996 **Ph.D. (Civil Engineering), University of Colorado, Boulder, USA**

- Thesis – Interface Cracks: Fracture Mechanics Studies Leading towards Safety Assessment of Dams

PROFESSIONAL EXPERIENCE

- Professor (2011 – Present), Associate Professor (2005 – 2011), Assistant Professor (1999 – 2005) and lecturer (1996 – 1999), Dept. Of Civil Engineering, Indian Institute of Science, Bangalore 560 012, India.
- Chairman (2011 – Present), Centre for Scientific and Industrial Consultancy, Indian Institute of Science, Bangalore, India
- Chairman (2013 – Present), Centre for Infrastructure, Sustainable Transportation and Urban Planning, Indian Institute of Science, Bangalore, India.

RESEARCH INTERESTS

- **Fracture and Fatigue behaviour of cementitious materials**
  - Plain concrete, Reinforced Concrete, Self Consolidating Concrete and Cold-jointed Interfaces
  - Experimental techniques – Micro and Nano Indentations, SEM, Acoustic emission, DIC
  - Development of Analytical Models – Dimensional Analysis, Thermodynamics

DOCTORAL RESEARCH GUIDANCE

1. Keerthy M. Simon, 2016, Studies on fracture and fatigue behaviour of cementitious materials: Effects of aggregate bridging, interfacial transition zone and microcracking.
2. Pervaiz Fathima, K. M., 2015, Studies on the modeling of fatigue crack growth and damage in concrete: A thermodynamics approach.
3. Sonalisa Ray, 2012, Studies on fatigue crack propagation in cementitious materials: A dimensional analysis approach
4. Hemalatha T, 2012, Studies on characterization of SCC: Microstructure, fracture and fatigue
5. S. G. Shah, 2010, Fracture and fatigue behaviour of concrete-concrete interfaces using acoustic emission, digital image correlation and micro-indentation techniques.
6. Khandelwal, R., 2008, Studies on the evaluation of thermal SIF for bi-material interfaces
7. Sain, T., 2008, Fracture mechanics based residual strength assessment of concrete members under fatigue
8. Rao, P. S., 2007, Fracture behaviour of jointed concrete interfaces.

RECENT PUBLICATIONS (Recent Five)

1. Pervaiz Fathima, K. M. and J. M. Chandra Kishen, 2015, "A thermodynamic Correlation between damage and fracture as applied to concrete fatigue", Engineering Fracture Mechanics, Volume 146, pp. 1 – 20.
2. Pervaiz Fathima, K. M. and J. M. Chandra Kishen, 2015, "Prediction of fatigue life in Plain concrete using entropy production", ASCE Journal of Engineering Mechanics, Vol. 141, Number 7.
3. Hemalatha, T, Ananth Ramaswamy and J. M. Chandra Kishen, 2015, "Micromechanical Analysis of Self Compacting Concrete", Materials and Structures (RILEM), V. 48, No. 11, pp 3719-3734.
4. A. V. Tumanov, V. N. Shlyannikov, J. M. Chandra Kishen, 2015, "An automatic algorithm for mixed mode crack growth rate based on drop potential method", International Journal of Fatigue, Vol. 81, pp. 227 – 237.
5. Pervaiz Fathima, K. M. and J. M. Chandra Kishen, 2015, "A thermodynamic Framework for the Evolution of Damage in Concrete under Fatigue", Archive of Applied Mechanics, Vol. 85, Issue 7, pp. 921 – 936.

VISION STATEMENT OF PROF. J. M. CHANDRA KISHEN FOR IA-FRAMCOS

As a member of the FraMCoS community and having attended the last four conferences at Vail, Catania, Jeju (along with two students) and Toledo (with five students), I feel responsible for restoring, maintaining and enhancing the steady growth of research in Fracture Mechanics as applied to cementitious materials.

There is a surge in the development of infrastructure projects in Southeast Asia and particularly in India during the last five years leading to multi-fold increase in construction and research activities. Hence, I would like to spread the ideas of fracture mechanics as applicable to cementitious materials in the southeast Asian region by organizing short-term lecture series, workshops related to fracture of concrete and conducting conferences. This nevertheless would promote the application of fracture mechanics to concrete, but to keep the momentum going, I would like to motivate and enthuse young researchers to contribute at these events.

With the current state of depleting economic resources in many countries around the world, it is becoming increasingly difficult for students and young researchers to travel and participate in technical discussions and conferences which are detrimental to the progress and development of this field. Hence, getting major cement and construction industries to provide sponsorship and setting up of a reasonably large corpus fund would be my priority for the growth of the FraMCoS activities.

Furthermore, another important activity I wish to bring about in FraMCoS conference is the inclusion of uncertainity theories and probabilistic tools in the application of fracture mechanics to concrete, polymers, rock, ceramics and bio-materials by organizing workshops and short term courses in these specialized areas. In short, I wish to see the active presence of IA-FraMCoS across different regions of the world.

Eric N. Landis

Biographical Sketch

Eric Landis is the Frank M. Taylor Distinguished Professor of Civil Engineering at the University of Maine. His research interests are in experimental mechanics and fracture, with particular focus on innovative laboratory techniques to solve problems of damage in cement-based and wood-based composite materials. He also dabbles in computational modeling, biomimetics, burrowing marine invertebrates, and other things he should probably keep his nose out of. He has particular expertise in x-ray computed tomography and associated 3D image processing, as well as a background in quantitative acoustic emission analysis techniques. He has published 150 scientific papers, and he is co-author of the text *Fracture and Fatigue of Wood*.

He is a member in a number of professional societies, including ASCE, ACI, SEM, and RILEM, and he serves on the editorial board of several journals. He is a co-organizer of the 9th International Conference on Fracture Mechanics of Concrete and Concrete Structures (FraMCoS-9).

He has a BS & PhD degrees in civil engineering from the University of Wisconsin (1985) and Northwestern University (1993). He has been at the University of Maine since 1994, and he has had visiting appointments in Switzerland (EPFL in 1998, ETH in 2005) and France (Université Joseph Fourier in 2008).

Vision for IA-FraMCoS

IA-FraMCoS was born out of a collective vision for coordinating and sharing research in fracture of quasi-brittle materials. The FraMCoS conference series has been a popular forum for international scholars to not only share their latest work, but to produce a *de facto* state-of-the-art picture of the field through the proceedings volumes. The Association's "Founding Fathers" set up a robust organization that is capable of adapting to different movements of the field, and to different interests of the participants.

As the strong interest and participation in FraMCoS-9 shows, the organization is clearly in good health, so I do not believe a major overhaul is necessary. As a member of the Board, I will work with the membership and other interested parties to keep the organization responsive to changes in the field. There is merit in the organization keeping true to its founding goals, but it should not be so static that it cannot adapt to new trends, both topical and administrative. I would like to see an openness and inclusiveness, and I would like to see active engagement and cultivation of younger members who, with their energetic enthusiasm, will be ready to take leadership roles in the near future.

Nominee IA-FracMCoS Board of Directors

Erik Schlangen

Short BIO

Dr. Erik Schlangen is Professor in the chair of "Experimental Micromechanics" at the faculty of Civil Engineering and Geosciences at Delft University of Technology in the Netherlands. He is also the director of the Microlab for micromechanical and material research which is part of the same University. Prior to joining Delft University he was a senior materials engineer at the materials research institute Intron in the Netherlands. He has a MSc-degree in Structural Engineering from Eindhoven University of Technology and a PhD from Delft University, where he graduated in 1993.

He is specialized in fracture mechanics of quasi-brittle materials like concrete, durability mechanics, finite element modelling, design of experimental techniques and self-healing of concrete and asphalt. He is the inventor of the Delft lattice model for simulation of fracture. He owns a patent on healable concrete. He initiated the self-healing bacterial concrete and is the inventor of the self-healing asphalt with steel-wool and induction heating that is applied in several applications.

He is editor of the International Journals 'Construction and Building Materials' and 'Advances in Concrete Construction'. He edited several state of the art reports and conference proceedings and has (co)author of more than 300 technical papers in Journals and conference proceedings and has given many key-note and invited lectures at conferences.

He has been part of the IA-Framcos since Framcos1 in Breckenridge, but unfortunately missed Framcos3 and 4 because he was then working in industry.

Vision Statement Framcos

Framcos has now a history of 25 years. It is from the beginning dealing with fundamental fracture mechanics problems, but also applications of fracture mechanics in design. Size effect has always been one of the important topics. In the past 25 years the knowledge of fracture mechanics of concrete has grown tremendously. This is one of the achievements of this conference series, which is by far the best on this topic.

The focus of the conference is expanding and what we see in the last issues is that more focus is on combined actions, like mechanics and transport, which puts more focus on durability and degradation mechanisms of materials and structures.

This durability mechanics is becoming more and more important in the future because all our existing concrete structures are ageing and maintenance, repair and rehabilitation are the research topics for the years to come. These topics should be on the agenda for the future framcos conferences.

Another topic which needs attention is the combination of 'other' materials and concrete. Repair and strengthening of structures will make use of 'other' materials. Connections and bond between these materials are issues that form a challenge for both computations and experimental research.

A way to attract more 'young' researchers to the conferences is to organise special workshops or summer schools for PhD-students and Post-docs on various topics dedicated to fracture mechanics topics in the week before or after the conference.

Brief Biography

Dr. Shilang XU is a Full Professor and the Director of the Institute of Advanced Engineering Structures and Materials, the Zhejiang University, China. He was the Dean of the College of Civil Engineering and Architecture, the Zhejiang University from 2009 to 2014. He received his Ph.D. degree in the Dalian University of Technology, China in 1988. In 1992 he visited College of Cardiff, University of Wales, United Kingdom as a visiting Professor for 10 months. From November 1992 to October 1994, he worked in University of Stuttgart, Germany as a Research Fellow of the Alexander von Humboldt-Stifurg and then from October 1994 to February 2003 as a Research Engineer in the Department of Construction Materials in University of Stuttgart. From 1995 to 2009, he was a Full Professor of the Dalian University of Technology. He has conducted research over the past three decades on concrete fracture mechanics, high-performance cementitious composites, hybrid structures, hydraulic structures and dam safety analysis. He has published over 360 scientific papers. In the field of fracture mechanics of concrete and crack propagation in cementious materials, he has published 100 papers in peer reviewed journals including International Journal of Fracture, Engineering Fracture Mechanics, ASCE Journal of Materials in Civil Engineering, ACI Structural Journal, RILEM Materials and Structures as well as China Civil Engineering Journal, Hydraulic Engineering Journal etc. He proposed the double-K fracture criterion cooperated with Professor Hans Wolf Reinhardt. He is a Senior Member of RILEM and serves as the president of the RILEM Technical Committee TDK: Testing methods for determination of double-K criterion for crack propagation in concrete. He also serves as the Chairman of Chinese Committer of Fracture, Damage and Strength of Concrete and Rock from 2005 up to now. The double-K fracture criterion has been selected as a national standard method in the Chinese National Standard DL/T 5332-2005 which was published in 2005 by the Government. The double-K fracture criterion was applied for safety assessments of crack propagation in concrete dams including the Three Gorges Dam on the Yangtse River (the largest dam in the world), the Dongfeng Arch Dam in Wujiang River and the Dangjiangkou Dam in Dangjiang River. He has been the winner of the Alexander von Humboldt Foundation in 1992, the National Natural Science Fund for Distinguished Young Scholars in 1996 and was selected as the distinguished professor for “Yangtze River Scholar Program” launched by Chinese Ministry of Education in 2000. He won the second prize for National Natural Science Award of China in 2015.

Vision Statement for FraMCoS

Professor Shilang XU take an active part in FraMCoS conferences science 1998 and is the Member of the International Scientific Committee of FraMCoS‐5/6/7/8/9. For Asian countries, the triennial conferences have been held in Japan (1998) and Korea (2010). As the world's second-largest economy, China now produces half of the world's cement and the rapid development of construction industry also produced the concrete of 10 billion tons. As the increase of concrete structures in China, many Chinese scholars focus on the fracture mechanics of concrete and concrete structures. Thus, in the future, FraMCoS should pay more attention to China. In this way, Professor Shilang Xu would like apply for chairing the FraMCoS‐11 to be held in Hangzhou in China.