

Workshop-3 Program

3rd Mobile Load Simulator, Big Data and Standards Seminar

第3届公路移动式路面加速加载系统MLS试验技术标准和大数据研讨会

IFRAE Workshop (15 July 2021) Delft, the Netherlands 荷兰德尔富特 2021年7月15日



Join hands together in sharing ideas to develop
"Circular, Sustainable and Smart Pavements for Tomorrow..."

HOSTS

International Society of the Mobile Load Simulators(ISMLS)

South Africa-China Transport Co-operation Center(SACTCC)

Delft University of Technology(TU Delft)

Tongji University(TJU)

SPONSORED by China Highway and Transportation Society(CHTS)

Workshop-3

IFRAE Workshop (15 July 2021) Virtual Meeting

Join Zoom Meeting

<https://tudelft.zoom.us/j/96180473783?pwd=YnlScFFNdW1Va21JVldnU3VyenZYdz09>

Meeting ID: 961 8047 3783

Passcode: 040123

at 11:25am (SA and the Netherlands Time) 中国时间下午 5 点 25 分

3rd Mobile Load Simulator, Big Data and Standards Seminar

第 3 届公路移动式路面加速加载系统 MLS 试验技术标准和大数据研讨会

主办：国际移动式路面加速加载学会 (ISMLS)，南非-中国交通合作中心(SACTCC)，
德尔夫特理工大学土木与地学科学学院 (TUDelft)，同济大学交通运输工程学院 (TJU)

支持指导：中国公路学会 (CHTS)

Organized by

**International Society of the Mobile Load Simulators(ISMLS)
South Africa-China Transport Co-operation Center(SACTCC)
Delft University of Technology(TUDelft)
Tongji University(TJU)**

Sponsored by

China Highway and Transport Society(CHTS)

Time Slot	Specialist	Topic for Presentation
Opening CEST & SAST time 11:25-11:50 China Beijing Time 17:25-17:50	Mr. Yuchen Wang, ISMLS, SACTCC	Welcome and Introduction
	Mr. Yun Qiao, Deputy, Secretary-General of the China Highway and Transport Society(CHTS)	Speech on behalf of the CHTS and the World Transport Convention(WTC). CHTS is a sponsor of this IFARE and the WTC
	Dr. Anupam Kumar, Delft University of Technology(TUDelft), the Netherlands	Speech on behalf of the TUDelft and the IFARE

	Dr. Shutao Meng, Research Institute of Highway(RIOH), Ministry of Transport, PR, China	Speech on behalf of Road Research and Development and Standards
	Mr. Wayne Zhang, TIPTOP	Speech on behalf of the MLS Test System(Pty) and MLS Users Group
Presentation 1 CEST & SAST time: 11:50-12:15 China Beijing Time 17:50-18:15	Prof. Alex Visser SACTCC, ISMLS	Perspectives of South African Design Standards and the Application in Africa and China
Presentation 2 CEST & SAST time 12:15-12:40 China Beijing Time 18:15-18:40	Prof. Nanxiang Zheng Chang'an University, ISMLS Dr. Chuanhai Wu, Guangdong Hualu Transport Technology Co., Ltd.	Strategic Plan of Chinese National Standards of the MLS(2021-2023), Scope and Expectations
Presentation 3 CEST & SAST time 12:40-13:05 China Beijing Time 18:40-19:05	Dr. Emile Horak University of Pretoria, Kubu Consultancy	Development of the Digital Video Assessment (DVA) as Catalyst for Skills Transfer in the Roads and Airports Visual Condition Assessment Environment
Break 10 minutes		
Presentation 4 CEST & SAST time 13:15-13:40 China Beijing Time 19:15-19:40	Associate Prof. Chuanyi Zhuang, ISMLS	1/3 Scale APT (Accelerated Pavement Testing) Tools to Evaluate Rock Modified Asphalt Mixture
Presentation 5 CEST & SAST time 13:40-14:05 China Beijing Time 19:40-20:05	Dr. Peter Mikhailenko, EMPA, Switzerland	Testing of Low-noise Semi-dense Asphalt in Switzerland
Presentation 6 CEST & SAST time 14:05-14:30 China Beijing Time 20:05-20:30	Dr. Emile Horak, University of Pretoria, Kubu Consultancy Prof. James Mainam, University of Pretoria	Using Rational Bailey Ratios and Derived Porosity to Gauge the Permeability Potential of Asphalt Mixes

Break 10 minutes		
Presentation 7 CEST & SAST time 14:40-15:05 China Beijing Time 20:40-21:05	Prof. Xingyu Gu Southeast University Dr. Chunying Wu, JSTI Group, Nanjing, China Bingfeng Zheng JSTI Group, Nanjing, China	Full-scale Test and Research on Asphalt Pavement Structure with MLS66
Presentation 8 CEST & SAST time 15:05-15:30 China Beijing Time 21:05-21:30	Prof. Lijun Sun, Tongji University, Shanghai, China Dr. Huailei Cheng, Tongji University, Shanghai, China	Fatigue Behaviour and Mechanical Response Analysis of Asphalt Pavements Based on APT Tests
Presentation 9 CEST & SAST time 15:30-15:55 China Beijing Time 21:30-21:55	Yuchen Wang, ISMLS, SACTCC	Round Table Guests: Dr. Rongji Cao, Prof. Qiao Dong, Mr. Yu Jia, Prof. Liping Liu, Dr. Feng Liu, Prof. Jiupeng Zhang, Prof. Liqun Hu, Prof. Songtao Lv, Prof. Zhigang Zhou, Prof. Duanyi Wang, Dr. Zefeng Tian, Prof. Wynand Steyn, Mr. Johan Muller, Mr. Kaisheng Mei, Mr. Yunfei Wang, Prof. Chichun Hu, Dr. Daniel Grosseegger, Mr. Jacky Masilela Summary of the Findings and Outlining the South African National Standard and the Chinese National Standard on MLSs to work together and Targeting for ISO Standards
End		

Seminar Chairs



Professor Alex Visser is an emeritus professor in the Department of Civil Engineering who was the SA Roads Board Professor in Transportation Engineering at the University of Pretoria with a career of more than 30 years at the University.

He is a Fellow and Past-President of the South African Institution of Civil Engineering (SAICE) and a Fellow of the South African Academy of Engineering. In 1998 he was awarded the SAICE Award for Meritorious Research for his contributions to low volume road technologies and in 2004 he received the Chairman's Award from the Transportation Division for contributions to transportation engineering. He was awarded Emeritus membership of the US

Transportation Research Board Low-Volume Roads committee in 2006 for lifelong services rendered. Besides providing mentorship to undergraduate and post-graduate students, he also administers the post-graduate programme in the Department. This involves responding to queries from prospective students regarding uncertainties not covered in the post-graduate brochure. He has performed extensive research on non-traditional stabilisers for improving road materials. He has published extensively, and continues to do so, and lectures internationally on these topics. Since retiring he has also provided advice on projects around the world. Currently he has worked at Low volume road design and maintenance, roads for ultra-heavy applications, interlocking block paving, and road management systems. Prof. Alex Visser is an advisor of the South Africa-China Transport Co-operation Center(SACTCC) and the specialist of the International Society of the Mobile Load Simulators(ISMLS).



Yuchen Wang is a principal researcher of China-Africa Transport Strategy Research Institute(CATSRI) based in Pretoria, South Africa. He graduated from Southwest Jiaotong (Transport) University, China in January 1982 and obtained his Bachelor's Degree. At the same year he worked as an assistant lecturer at the same university for 8 months. Then he studied at Chang'an University (Before as Xi'an Highway Transport University) from 1982 to 1985 and earned his Master's Degree. He worked as a Research engineer to Senior research engineer at the Research Institute of Highway (RIOH), Ministry of Transport, PR, China from 1985 to 1994. From the joint program by

Canadian and Chinese authorities, he received a comprehensive certificate on transport work in 1994. As a visiting scholar, he undertook the research investigations in South Korea, Hong Kong and Macau from late 1994 to early 1995. As a principal engineer, he worked at the National Department of Transport, South Africa from May 1995 to Nov. 2000. After that, he had undertaken the project development at the CSIR Transportek until Nov. 2004. As a founder and executive director of Sunrise Project Consultants International (SPCI), he achieved the

number of successful projects between South Africa, Southern Africa and China from 2005 to date. He published the professional books and papers on the conferences and journals.

He was a member and Deputy Chairman of China-Africa Engineering Association in South Africa from 1997 to 2006. He has been the Founder and Executive Director of the South Africa-China Transport Co-operation Center (SACTCC) since 2004. Currently he is the Chairman of the Southern Africa-China SET and Education Association (SETEA). Mr. Wang has been an organizer of the Annual International Conference of Science, Engineering & Technology and Management of Innovation (SETMI) since 2000 and a convenor of the China-Africa Transport Co-operation Forum under the Southern African Transport Conference (SATC) for 8 years.

He is current Secretary-General of the International Society of the Mobile Load Simulators(MLS).

Seminar Convenor



Dr. Peng Lin works as a postdoctoral researcher at the Pavement Engineering Section in the Delft University of Technology. He graduated from Department of Civil Engineering in Chongqing University in 2013. In 2016 and 2020 he received his Masters's and Doctor's degree in Tongji University, respectively. His main research interests are the experimental and numerical characterization of polymer modified bitumen. He is recently working on recycling asphalt pavement materials to improve the circular economy and reduce raw materials consumption and CO2 emissions. Research topics include developing innovative rejuvenators for high-performance recycling of polymer modified asphalt mixture and high-quality cold in-place recycling techniques. He has published 32 peer-reviewed journal or conference articles, consisting of 16 SCI papers as first/corresponding author. He also serves as a young editor for a technical journal and the reviewer for 12 SCI journals. He was awarded the National Scholarship for Doctoral Student, Excellent Graduates in Shanghai and Science and Technology Progress Award in Guangzhou. He is the fundraising/young committee member of IACIP, TRC and IFRAE, and the member of TRB, AAPT, RILEM and APSE.

He is an active member of the International Society of the Mobile Load Simulators(MLS).

About the speakers

Topic 1 : Perspectives of South African design standards and the application in Africa and China



Professor Alex Visser is an emeritus professor in the Department of Civil Engineering who was the SA Roads Board Professor in Transportation Engineering at the University of Pretoria with a career of more than 30 years at the University.

He is a Fellow and Past-President of the South African Institution of Civil Engineering (SAICE) and a Fellow of the South African Academy of Engineering. In 1998 he was awarded the SAICE Award for Meritorious Research for his contributions to low volume road technologies and in 2004 he received the Chairman's Award from the Transportation Division for contributions to transportation engineering. He was awarded Emeritus membership of the US Transportation Research Board Low-Volume Roads committee in

2006 for lifelong services rendered. Besides providing mentorship to undergraduate and post-graduate students, he also administers the post-graduate programme in the Department. This involves responding to queries from prospective students regarding uncertainties not covered in the post-graduate brochure. He has performed extensive research on non-traditional stabilisers for improving road materials. He has published extensively, and continues to do so, and lectures internationally on these topics. Since retiring he has also provided advice on projects around the world. Currently he has worked at Low volume road design and maintenance, roads for ultra-heavy applications, interlocking block paving, and road management systems. Prof. Alex Visser is an advisor of the South Africa-China Transport Co-operation Center(SACTCC) and the specialist of the International Society of the Mobile Load Simulators(ISMLS).

Topic 2: Strategic Plan of Chinese National Standards of the MLS(2021-2023), Scope and Expectations



Professor Nanxiang Zheng is in charge of many social jobs , including the director of the New Road Technology Research Institute of Chang 'an University, Director of The International Cooperative Research Center for Road Maintenance Technology of Chang 'an University, member of China Highway Association Road Maintenance and Management Branch. His research interests conclude: durability pavement structure and materials ; technology , materials and methods for highway pavement maintenance ; environmental friendly pavement and recycle technology, etc.

He has presided over more than 50 national and provincial scientific research projects, edited four books, and there were more than 100 master and doctoral students graduated under his supervise. He established the basic theory for crack resistance of semi-rigid base material , the theoretical and empirical design method of lime-fly ash stabilized aggregate base, and developed the environment-friendly TSEM asphalt pavement for tunnel. He has won the second prize of National Science and Technology Progress award, the first prize of National Education Commission science and technology Progress Award, and more than ten provincial and municipal science and technology Progress awards.

He is the technical committee chair of the International Society of the Mobile Load Simulators(MLS).



Dr. Chuanhai Wu is currently the Chief Expert and Chief Engineer of Guangdong Hualu Transport Technology Co. Ltd. He is also a member of National Technical Committee of Asphalt Concrete Standardization, the Expert of Science Communication of China Highway and Transport Society, and Director of Guangdong Young Scientists Association. He has been honoured with the titles of "Model Worker of Guangdong Province", "National Outstanding Science and Technology Worker", "One hundred Outstanding Highway Engineers of China" and so on. In recent years, he has presided over and completed more than twenty scientific and

technological projects in the field of pavement engineering, obtained 13 provincial and ministerial science and technology awards, as well as more than twenty national technological patents. He published one academic book and more than one hundred technical papers.

Topic 3: Pavement Monitoring: Development of the Digital Video Assessment (DVA) as Catalyst for Skills Transfer in the Roads

and Airports Visual Condition Assessment Environment



Dr. Emile Horak has worked in various research projects related to pavement engineering and materials, structural design, construction, rehabilitation, structural evaluation of road pavements and instrumentation. Research has included literature surveys, laboratory investigations, field experiments, liaison with industry (road authorities, consultants and contractors), preparation of research documentation (reports, papers, articles and dissertations) and oral reporting (national and international conferences and courses since 1993). Pavement projects include evaluations of both new and rehabilitated pavements, ranging from low volume to national highways standards. A substantial amount of work was done using full scale Accelerated Pavement Testing (APT) testing.

He was project leader and supervisor to an early (2003/4) master's student on the use of Nano Technology in erosion protection of natural gravels for gravel resource preservation. Dr. Horak has undertaken the feasibility study involving possible use of two competing nanotechnology applications on a mine haul and construction access road near Maun in Botswana. Emile is currently part of the research team appointed by SANRAL on a number of research areas. One of the projects he is cooperating on involves Nano-based products, such as Nano-Modified Emulsions (NMEs) which offers hydrophobic properties that claim to improve marginal materials, i.e. poor quality materials which are usually unusable for road works. Therefore, the use of marginal materials stabilised with NMEs enables them to be directly suitable for road construction, whilst simultaneously providing better performances than good quality imported materials or materials stabilised with conventional bitumen emulsions. Therefore, the implementation of NMEs not only has the potential to reduce the overall cost of road infrastructure in South Africa, but it also provides a more sustainable and environmentally friendly alternative to conventional bitumen stabilising agents and currently adopted construction techniques.

Topic 4: 1/3 Scale APT (Accelerated Pavement Testing)

Tools to Evaluate Rock Modified Asphalt Mixture



Dr. Chuanyi Zhuang is an associate professor of Shandong Jiaotong University, engaged in pavement structure and material research. He graduated Master's degree from Chang'an University in 2006, and Doctor's degree from Chang'an University in 2012. He is the author of 18 papers, articles and research reports.

He has presided over one Post Doctoral Fund, one Provincial Natural Science Fund and one provincial education department project. In recent three years, he has participated in and completed three provincial transportation science and technology projects and one applied basic research project of the Ministry of transportation. Published more than 20 papers and authorized 2 invention patents. He edited one textbook and one monograph. It has won one third prize of science and technology progress of Shandong Province, one second prize of China highway society and two first prizes of science and technology of provincial universities.

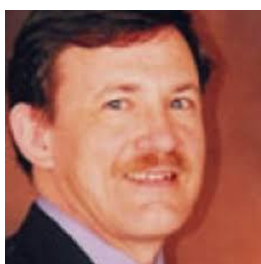
Dr. Chuanyi Zhuang is the current Deputy Secretary-General of the International Society of the Mobile Load Simulators (MLS).

Topic 5: Testing of low-noise semi-dense asphalt in Switzerland



Dr. Peter Mikhailenko is an asphalt researcher hailing from Toronto, Canada. In 2015, he completed his PhD at the Université Paul Sabatier in Toulouse, France on the topic of using agricultural waste derivatives in asphalt construction. During his post-doc at the University of Waterloo in Canada, he worked on asphalt aging, polymer modification and microstructure analysis among other topics. Since 2019, he has been at the Laboratory for Concrete and Asphalt of Empa in Switzerland, working on the replacement of virgin materials in asphalt roads by alternatives from various waste streams, which the current work is a part of.

Topic 6: Using Rational Bailey Ratios and Derived Porosity to Gauge the Permeability Potential of Asphalt Mixes



Dr. Emile Horak has worked in various research projects related to pavement engineering and materials, structural design, construction, rehabilitation, structural evaluation of road pavements and instrumentation. Research has included literature surveys, laboratory investigations, field experiments, liaison with industry (road authorities, consultants and contractors), preparation of research documentation (reports, papers, articles and dissertations) and oral reporting (national and international conferences and courses since 1993). Pavement projects include evaluations of both new and rehabilitated pavements, ranging from low volume to national highways standards. A substantial amount of work was done using full scale Accelerated Pavement Testing (APT) testing.

He was project leader and supervisor to an early (2003/4) master's student on the use of Nano Technology in erosion protection of natural gravels for gravel resource preservation. Dr. Horak has undertaken the feasibility study involving possible use of two competing nanotechnology applications on a mine haul and construction access road near Maun in Botswana. Emile is currently part of the research team appointed by SANRAL on a number of research areas. One of the projects he is cooperating on involves Nano-based products, such as Nano-Modified Emulsions (NMEs) which offers hydrophobic properties that claim to improve marginal materials, i.e. poor quality materials which are usually unusable for road works. Therefore, the use of marginal materials stabilised with NMEs enables them to be directly suitable for road construction, whilst simultaneously providing better performances than good quality imported materials or materials stabilised with conventional bitumen emulsions. Therefore, the implementation of NMEs not only has the potential to reduce the overall cost of road infrastructure in South Africa, but it also provides a more sustainable and environmentally friendly alternative to conventional bitumen stabilising agents and currently adopted construction techniques.



Prof. James Maina is a full-time professor of civil engineering at the University of Pretoria in South Africa, a fellow of the South African Academy of Engineering (SAAE) and a registered professional engineer with Engineering Council of South Africa (ECSA). He is an expert in numerous fields of science, engineering and technology (SET) focusing on: Design, Analysis and Performance Evaluation of pavement structures (roads and airports); Numerical modelling and computer programming; Characterization of mechanical properties of pavement materials; Tire-Pavement Interactions and Contact Stresses measurements; Non-destructive field testing of pavements based on Falling Weight Deflectometer (FWD); High performance computing (HPC) and parallel processing, and Quality Assurance and Quality Control (QA/QC) of Roads Construction Projects.

Topic 7: Full-scale test and research on asphalt pavement structure with MLS66



Professor Xingyu Gu, Depty Dean of School of Transport and the Doctoral Supervisor. He is working at the Department of Road and Railway Engineering at the School of Transport, Southeast University, Nanjing, China.

Educational experience • 1993.09~1997.06, major in Road and Railway Engineering, School of Transportation, Southeast University Bachelor degree • 1997.09~2002.04 Southeast University School of Transportation Road and Railway Engineering majored in Ph.D. 2010.04~2011.04 Virginia

Tech visiting scholar.

Work experience • 2002.04 to date: Southeast University School of Transportation Road and Railway Engineering Lecturer/Associate Professor/Professor.

Research areas • Highway and airport surface materials, structure and maintenance management, Multi-scale mechanical simulation of road materials, Non-destructive testing technology and equipment of roads, Green and intelligent road traffic infrastructure.



Dr. Chunying Wu, PhD, senior engineer at the research level, is currently the assistant dean and deputy chief engineer of Transportation Science Research Institute of JSTI Group, and also director of the Institute of Road Engineering of JSTI Group. She has presided over and completed more than 20 provincial-level and ministerial-level projects. She has won more than 20 provincial-level and ministerial-level awards, such as China Highway Society. Completed the transformation project of scientific and technological achievements of Jiangsu Provincial Department of Science and Technology as the technical person in charge, the net profit was about 37 million RMB during the implementation period. Published 50 papers in Both Chinese and

English, 15 of which were indexed by SCI and EI. Published 1 monograph; 31 patents have been authorized; Participated in the preparation of 3 local standards and 4 group standards.



Bingfeng Zheng graduated from Hohai University with a master's degree in civil engineering materials. He joined road engineering research institute of JSTI in 2010 and now works as deputy chief engineer. More than 30 items are involved in pavement accelerated loading test, sensor mechanical response monitoring, highway reconstruction and expansion technology, foam warm mix technology,

Hamburg rut test evaluation method, solid waste recycling, pavement base crack resistance technology, foam asphalt cold recycling technology, semi flexible pavement base technology and so on.

Topic 8: Fatigue behaviour and mechanical response analysis of asphalt pavements based on APT tests



Professor Lijun Sun received his Ph.D. degree in 1989. Since 1993, he has been a professor in the Department of Road and Traffic Engineering, and a CKSP professor in the College of Transportation Engineering at Tongji University since 1998, vice director of Academic Committee of Tongji University since 2021. He is the dean of Advanced Institute of Intelligent Transportation Studies and director of Road and Traffic Institute. He received the National Outstanding Youth Research Found in 2003. He is a

member of Expert Committee of China Ministry of Transportation, and a member of the council of China Highway Society, China Civil Engineering Society, and China Intelligent Transportation System Society. His research interests focus on pavement structure, material, and pavement nondestructive evaluation, performance, preventative maintenance management, and pavement recycling, as well as intelligent transportation management. He establishes the behavior mechanics for asphalt pavement, the first pavement management system of China, and the first intelligent traffic guidance system of China. His research results have been incorporated in the specifications of the China Ministry of Transportation, China Ministry of Construction, and China Bureau of Civil Aviation for pavement design, evaluation, and maintenance. He has published more than 600 technical papers, 13 books in his research fields, and won 3 National Prizes of Science and Technology Progress Awards and 35

provincial-level Science and Technology Progress Awards. He is the chief writer of China Specifications of Airport Paving Design, and one of the main writers of China Specifications of Asphalt Pavement Design.



Dr. Huailei Cheng now is the post-doctoral research fellow in the college of transportation engineering of Tongji University. He received his bachelor and doctor degrees in transportation engineering from Tongji University, and is pursuing his dual doctoral degree from The Hong Kong Polytechnic University. His research area is the analysis of mechanical and physical properties (especially the fatigue and modulus properties) of asphalt pavement (mixture) via multi-scale tests and simulations. He has published more than 25 peer-reviewed journal or conference articles, and served as the reviewer for nearly 10 journals. He has received numerous awards, including the Best Doctoral Dissertation Award of China Highway and Transportation Society (CHTS), 1st prize of Scientific & Technological Achievements of CHTS, the Best Paper Award of 2021 WTC conference, etc. Recently, he received the funds from the “Postdoctoral Innovative Talents Program of China” and the “Super Postdoctoral Incentive Program of Shanghai”.

Topic 9: Summary of the Findings and Outlining the South African

National Standard and the Chinese National Standard on MLSs to work

together and Targeting for ISO Standards



Yuchen Wang is a principal researcher of China-Africa Transport Strategy Research Institute (CATSRI) based in Pretoria, South Africa. He graduated from Southwest Jiaotong (Transport) University, China in January 1982 and obtained his Bachelor's Degree. At the same year he worked as an assistant lecturer at the same university for 8 months. Then he studied at Chang'an University (Before as Xi'an Highway Transport University) from 1982 to 1985 and earned his Master's Degree. He worked as a Research engineer to Senior research engineer at the Research Institute of Highway (RIOH), Ministry of Transport, PR, China from 1985 to 1994. From the joint program by Canadian and Chinese authorities, he received a comprehensive certificate on transport work in 1994. As a visiting scholar, he undertook the research investigations in South Korea, Hong Kong and Macau from late 1994 to early 1995. As a principal engineer, he worked at the

National Department of Transport, South Africa from May 1995 to Nov. 2000. After that, he had undertaken the project development at the CSIR Transportek until Nov. 2004. As a founder and executive director of Sunrise Project Consultants International (SPCI), he achieved the number of successful projects between South Africa, Southern Africa and China from 2005 to date. He published the professional books and papers on the conferences and journals.

He was a member and Deputy Chairman of China-Africa Engineering Association in South Africa from 1997 to 2006. He has been the Founder and Executive Director of the South Africa-China Transport Co-operation Center (SACTCC) since 2004. Currently he is the Chairman of the Southern Africa-China SET and Education Association (SETEA). Mr. Wang has been an organizer of the Annual International Conference of Science, Engineering & Technology and Management of Innovation (SETMI) since 2000 and a convenor of the China-Africa Transport Co-operation Forum under the Southern African Transport Conference (SATC) for 8 years.

He is current Secretary-General of the International Society of the Mobile Load Simulators(MLS).

Contact Email: ifrae2021@gmail.com

Weblink: <https://www.ifrae-delft.com/program>

<https://www.ifrae-delft.com/program>