XVIII SITRAER

Oct. 22-24, 2019 - Brasilia

XVIII AIR TRANSPORTATION SYMPOSIUM

SITRAER 2019

Conference Program

Brasilia, Brazil
2019

XVIII SITRAER

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Program

Schedule	Tuesday, October 22nd		
08:00	**Registration**		
09:00 to 10:30	**Opening Session – XVIII SITRAER** Authorities from UnB, SAC, ANAC, DECEA, CAPES, ITA, Infraero and others		
10:30 to 11:00	**Coffee Break**		
11:00 to 11:40	**Keynote Speaker:** Prof. Dr. Johannes Reichmuth (Institute of Air Transport and Airport Research no German Aerospace Center, German) "Challenges on the way to a sustainable air transport system"		
11:40 to 12:20	**Keynote Speaker:** Prof. Dr. Wu Renbiao (Civil Aviation University of China - CAUC, China) "Adaptive Interference Mitigation in Global Navigation Satellite Systems GNSS"		
12:20 to 13:00	**Panel:** "Constructing an Origin/Destination Matrix of Brazilian interurban transport with mobile phone Big Data - Identifying potentials for civil aviation development" Leandro Rodrigues e Silva, Fabiana Todesco (SAC – Secretaria de Aviação Civil, Brazil)		
13:00 to 14:30	**Lunch**		
14:30 to 15:10 15:10 to 16:30	**Panel**: "Urban Air Mobility" Agenir de Carvalho Dias (Atech) Systems Technology – S1	Air Traffic Management I – S2	Airport Management and Operation – S3
16:30 to 16:45	**Coffee Break**		
16:45 to 17:10 17:10 to 18:00	**Panel:** "O risco de drones em áreas próximas a aeródromos" César Augusto Mayor Herrera (IACIT)	Mini course of advanced machine learning (1) – S2 Prof. Luís Garcia (UnB)	Airport Management and Operation – S3
18:00	**Conference cocktail**		

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Schedule	Wednesday, October 23rd		
08:00	Registration		
09:00 to 09:40	**Panel:** "Highlights from Research on Airline Decision Support Services" Dr. Italo Romani de Oliveira (Boeing – Brazil)		
09:40 to 10:20	**Keynote Speaker:** Prof. Dr. Daniel Delahaye (ENAC, Toulouse, France) "Mathematical tools for trajectory modeling and design"		
10:20 to 10:50	Coffee Break		
10:50 to 11:30	**Keynote Speaker:** Prof. Dr. Peng Wei (Department of Aerospace Engineering, Iowa State University, USA) "Unlock the Personal Sky - Safe and Assured Autonomy for On-Demand Urban Air Mobility"		
11:30 to 12:10	**Panel:** "ATFM - O desafio da implantação do gerenciamento de tráfego aéreo no Brasil" Ten Cel Fabio da Silva Santos (DECEA – Departamento de Controle do Espaço Aéreo, Brazil)		
12:10 to 12:50	**Panel:** "Nova norma de SESCINC" Alexandre Romano Massignan Berejuk (ANAC – Agência Nacional de Aviação Civil, Brazil)		
12:50 to 14:30	Lunch		
14:30 to 15:10	**Panel**: "Pesquisa Aeroespacial na UnB" Prof. Victor Celestino (Centro de Pesquisa e Inovação Aeroespacial da UnB) Air Space Science	Air Traffic Management II – S2	Infraestrutrura – S3
15:10 to 16:30			
16:30 to 17:00	Coffee Break		
17:00 to 18:00	Airports and Airlines Performance I	Mini course of advanced machine learning (2) – S2 Prof. Luís Garcia (UnB)	Infraestrutrura – S3
18:00 to 19:00	SBTA Assembly		
19:00	**Social Event – Conference Dinner (Churrascaria Potência Grill, por adesão)**		

Schedule	Thursday, October 24th		
08:00	**Registration**		
09:00 to 09:40	**12th Workshop of IT for ATM** Eng. Camila Bassetto (DECEA) Prof. Li Weigang (UnB) "Ongoing iniciatives on SWIM lead by DECEA"		
09:40 to 10:20	**Keynote Speaker:** Prof. Dr. Alexandre Gomes de Barros (University of Calgary, Canada) "Connected aircraft - the future of air navigation and traffic control"		
10:20 to 10:50	**Coffee Break**		
10:50 to 11:30	**Keynote Speaker:** Prof. Dr. Annie LIANG (University of South Australia - UniSA, Australia) "Application of AI and Machine Learning to Automated Aircraft Sequencing and Merging in TMA"		
11:30 to 12:10	**Keynote Speaker:** Cel. Antonio Crespo (Concordia University, Canada) "Carbon Emissions Trading Systems and the Air Transportation Business Dynamics: Economic Modeling and Impacts Assessment"		
12:10 to 12:50	**Panel**: "Infraero e o futuro: Contextos e oportunidades com as lições aprendidas do processo de concessão de aeroportos no Brasil" Francisco Nunes (Infraero)		
12:50 to 14:30	**Lunch**		
14:30 to 15:10 **15:10 to 16:30**	**Panel:** "Busca da eficiência da aviação comercial brasileira" Ruy Amparo ABEAR Airports and Airlines Performance – S1	Airlines Regulation and Management – S2 Mini course of advanced machine learning (3) Prof. Luís Garcia (UnB)	Environment – S3
16:30 to 17:00	**XVIII SITRAER Close Session**		
17:00 to 18:00			

Technical sessions

	Systems Technology
	Tuesday (October 22nd), S1
14:30 - 15:10	**Panel:** "Urban Air Mobility: The challenges and opportunities for the implementation of an Urban Air Traffic Management System" **Agenir de Carvalho Dias** (Atech)
15:10 - 15:30	FAST PROTOTYPING OF WEB BASED COLLABORATIVE PLATFORM FOR HELICOPTER PILOTS Vivian Chiodo Dias, Beatriz Da Mota Bonanno, Wilson Roberto Rosa and Jose Airton Patricio 22
15:30 - 15:50	HLA Interaction in LVC Simulation Environment Mariana Yoshikawa, Fabio Aguchiku and Valter Cadore 32
15:50 - 16:10	DESENVOLVIMENTO DE UM SIMULADOR DE BAIXO CUSTO PARA UMA AERONAVE DE PEQUENO PORTE Mateus Miranda and Eduardo Freitas 41
16:10 - 16:30	ANÁLISE DE SENSIBILIDADE DO SOFTWARE FAARFIELD NOS RESULTADOS DE VIDA ÚTIL DE PAVIMENTOS AEROPORTUÁRIOS Mateus Lira and Francisco Oliveira 42
16:30 - 16:45	**Coffee Break**
16:45 - 17:10	Quantifying Capacity Losses of the Physical Separation of Domestic and International Passengers Using Discrete Event Simulation Max Georg Schulze Schwienhorst, Giovanna Miceli Ronzani Borille and Johannes Reichmuth 21
17:10 - 18:00	**Panel:** "O risco de drones em áreas próximas a aeródromos: Impactos e Contra-medidas" **César Augusto Mayor Herrera** (IACIT)
18:00	**Conference cocktail**

Air Trafic Management I	
Tuesday (October 22nd), S2	
14:30 - 14:50	MANAGING NETWORK FLIGHT DELAYS THROUGH COLLABORATIVE DECISION MAKING Sibusiso Moyo, Hamdan Sulayman Alfazari, Georges Mykoniatis and Felix Mora-Camino 2
14:50 - 15:10	A FORMAÇÃO DOS CONTROLADORES DE TRÁFEGO AÉREO NA AERONÁUTICA: UMA ANÁLISE DAS POLÍTICAS EDUCACIONAIS E SUAS PRÁTICAS Eduardo Silva and Lilian Ramos 6
15:10 - 15:30	SEGUNDA DEMONSTRAÇÃO DO SWIM NO CENÁRIO NACIONAL Camila Bassetto, Lorrene Carolline Vieira Nunes, Ivan Matias da Silva, Inaldo Capistrano Costa, Li Weigang, Lucas Borges Monteiro and Iuri Souza Ramos Barbosa 52
15:30 - 15:50	CAUSAL ANALYSIS OF VERTICAL FLIGHT INEFFICIENCY DURING DESCENTS Joao Basílio Tarelho Szenczuk, Mayara Condé Rocha Murça and Wallace Silva Sant' Anna Souza 34
15:50 - 16:10	SOLUÇÃO COMPUTACIONAL PARA PREVENIR ACIDENTES AERONÁUTICOS CAUSADOS POR ESTEIRAS DE TURBULÊNCIA USANDO MACHINE LEARNING Daniel Valério Leite, Geraldo P. Rocha Filho and Li Weigang 5
16:10 - 16:30	Desenvolvimento de um programa científico para avaliação de risco ionosférico para GBAS no Brasil Vinícius Pereira, João Monico and Paulo Camargo 26
16:30 - 16:45	**Coffee Break**
16:45 - 17:55	LOGICAL ACCESSMENT OF VULNERABILITY AT DEPARTING PASSENGERS CONTROL Carl Rizk, Sibusiso Moyo, Hadj Batatia and Felix Mora-Camino 3
16:55 - 17:55	Mini course of advanced machine learning (1) – S2 Prof. Luís Garcia (UnB)
18:00	**Conference cocktail**

	Airport Management and Operation
	Tuesday (October 22nd), S3
14:30 - 14:50	UMA REFLEXÃO SOBRE A ESCOLHA AEROPORTUÁRIA EM REGIÕES DE MÚLTIPLOS AEROPORTOS USANDO MÉTODO DE REVISÃO SISTEMÁTICA Guilherme Zapola and Viviane Falcão 10
14:50 - 15:10	The Increasing Distance of Airports from City Centers: an Exploratory Analysis of Airport Replacement and Multiple Airport System's Cases Luiz Henrique Werneck de Oliveira 11
15:10 - 15:30	GANHOS OBTIDOS COM O PROJETO FAUNA EM AEROPORTOS – UMA PARCERIA ENTRE A INFRAERO E A FUNDAÇÃO UNIVERSIDADE DE BRASÍLIA POR MEIO DO CENTRO DE APOIO AO DESENVOLVIMENTO Márcia Carvalho da Cunha Mendes and Luis Eduardo Paris 12
15:30 - 15:50	Quantificação de Poluentes Atmosféricos oriundos da Operação do Aeroporto Internacional de Cuiabá - Marechal Rondon por meio de Modelagem Matemática Jose Carlos Aravechia Junior, Gabriel Cotrim, Julia Prado and Arthur Fernandes 13
15:50 - 16:10	A INFLUÊNCIA DO GERENCIAMENTO INTELIGENTE NO EMBARQUE DE PASSAGEIROS EM TERMINAIS AEROPORTUÁRIOS COM A MUDANÇA NO PORTÃO DE EMBARQUE Diogo Vieira, Evandro Silva, Claudio Alves and Mauro Caetano 16
16:10 - 16:30	ANÁLISE DA LITERATURA SOBRE VALUATION DE CONCESSÕES AEROPORTUÁRIAS Eduardo Pereira and Pastor Taco 27
16:30 - 16:45	**Coffee Break**
16:45 - 17:05	REVISÃO SISTEMÁTICA CONCESSÕES AEROPORTUÁRIAS E O CASO BRASILEIRO Larissa Galdiano, Viviane Falcão and Francisco Gildemir da Silva 37
17:05 - 17:25	MENSURAÇÃO DA CULTURA DE SEGURANÇA EM AEROPORTOS Wilson Gomes 38
	A LONG TERM DEMAND FORECASTING FRAMEWORK FOR A NETWORK OF AIRPORTS Bachir Amadou, Mohammed Sbihi, Luis Gustavo Zelaya Cruz and Felix Mora-Camino 4
18:00	**Conference cocktail**

Airspace Technology	
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15:30 - 15:50	Trajectory Predictor Development and Integration Fabio Seiti Aguchiku, Fabio Joás de Carvalho Oliveira, Kleber Ferreira Rosa and Carlos Eduardo Duarte Vasques, 33
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17:00 - 17:20	PREVISÃO DE PASSAGEIROS DO AEROPORTO REGIONAL MÁRIO DE ALMEIDA FRANCO ENTRE PARES DE CIDADES Matheus Zamboni Zaffalon, Nathane Negri and Viviane Falcão 45
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17:40 - 18:00	Prisoner's Dilemma Game Approach to Decision Optimization in Collaborative Trajectory Options Program, Leonardo Cruciol, John-Paul Clarke and Li Weigang 53
19:00	**Social Event – Conference Dinner (TBD)**

Air Trafic Management II	
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14:50 - 15:10	DRONES AND RPAS' OPERATIONS' MANAGEMENT THROUGH A COLLABORATIVE PLATFORM Beatriz da Mota Bonanno, Vivian Chiodo Dias, José Airton Patrício and Wilson Roberto Freire Rosa 23
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16:30 - 17:00	**Coffee Break**
17:00 - 18:00	Mini course of advanced machine learning (2) – S2 Prof. Luís Garcia (UnB)
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Infraestrutrura	
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14:30 - 14:50	METODOLOGIA HQCM UTILIZADA PARA REFORMAS EM RUNWAYS DE AEROPORTOS REGIONAIS - UM ESTUDO DE CASO DA SUA UTILIZAÇÃO NA PPD 14/32 DO AEROPORTO DE PAULO AFONSO (SBUF-INFRAERO). Marcelo Ferreira Santos and Manoel Martins Oliveira Jr 1
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15:50 - 16:10	ANÁLISE DA INFLUÊNCIA DO PROCESSO DE REMOÇÃO DE BORRACHA NA MACROTEXTURA DE PAVIMENTOS AEROPORTUÁRIOS Francisco Bruno de Andrade Farias, Francisco Heber Lacerda de Oliveira, José Breno Ferreira Quariguasi and Túlio Rodrigues Ribeiro 46
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17:00 - 17:25	ESTUDO DOS FATORES QUE INFLUENCIAM NA ESCOLHA DE APLICATIVOS MÓVEIS DE MOBILIDADE PARA ACESSO TERRESTRE DE IMPORTANTES AEROPORTOS BRASILEIROS Carolina Ansélmo and Giovanna Borille 35
17:25 - 17:50	CUSTOMER EXPECTATIONS REGARDING THE AIRPORT SERVICE QUALITY: A STRUCTURAL MODEL George Christian Linhares Bezerra and Carlos Ferreira Gomes 30
19:00	**Social Event – Conference Dinner (TBD)**

Airports and Airlines Performance

Thursday (October 24th), S1

14:30 - 15:10	**Panel:** "Busca da eficiência da aviação comercial brasileira: a contribuição da indústria através da ABEAR" Ruy Amparo ABEAR (Associação Brasileira das Empresas Aéreas)
15:10 - 15:30	Análise Estratégica de Variância da fusão LAN-TAM no mercado de transporte aéreo de passageiros Luiz Alves and Carlos Henrique Rocha 51
15:30 - 15:50	O DIMENSIONAMENTO DO AEROPORTO DE RIBEIRÃO PRETO E SUAS LIMITAÇÕES OPERACIONAIS Ana Carolina Martins da Silva, Gabriela Carolina Martin Cerutti, João Gilberto Mendes dos Reis and Luiz Rodrigo Bonette 29
15:50 - 16:10	AVALIAÇÃO DA PERCEPÇÃO DOS PASSAGEIROS EM RELAÇÃO ÀS ATIVIDADES COMERCIAIS AEROPORTUÁRIAS UTILIZANDO NET PROMOTER SCORE Lenice Mirian Da Silva, Giovanna Miceli Ronzani Borille and Michelle Carvalho Galvão Da Silva Pinto Bandeira 31
16:30 - 17:00	**XVIII SITRAER Close Session**
17:00 - 18:00	

	Airlines Regulation and Management
	Thursday (October 24th), S2
14:30 - 14:50	Escolha de aeronaves para uma companhia aérea regional: um modelo de otimização inteira ajustado Thiago Dias De Jesus, Manuel N. Dias Barcelos Júnior, Mateus Rodrigues Miranda, Sergio Henrique Da Silva Carneiro and Victor Rafael Rezende Celestino 8
14:50 - 15:10	COMBUSTÍVEIS SUSTENTÁVEIS DE AVIAÇÃO: CRIANDO VANTAGEM COMPETITIVA Jackeline Oliveira and Rafael Igrejas 20
15:10 - 15:30	STATISTICAL COMPARISON ON FAIRNESS FOR HORIZONTAL EFFICIENCY IN TMA AREA FOR BRAZILIAN AIRLINES: CASE STUDY OF SDU-CGH Wallace Souza 25
15:30 - 15:50	USO DE SISTEMA DE INDICADORES PARA EXPANSÃO DE REDE DE AEROPORTOS - ESTUDO DE CASO DO PLANO AEROVIÁRIO NACIONAL Danielle Mota, Fabiana Todesco, Leandro Silva, Marcelo Vilela and Rubem de Paula 28
15:50 - 17:00	Mini course of advanced machine learning (3) – S2 Prof. Luís Garcia (UnB)
16:30 - 17:00	**XVIII SITRAER Close Session**
17:00 - 18:00	

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Environment	
Thursday (October 24th), S3	
14:30 - 14:50	COMPARAÇÃO ENTRE A EMISSÃO DE CO2 COM O USO DO AUTOMÓVEL E DO AVIÃO PARA O TRECHO SÃO PAULO/SP – RIO DE JANEIRO/RJ Barbara Azevedo and Taíza Sordi 18
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16:30 - 17:00	**XVIII SITRAER Close Session**
17:00 - 18:00	

Prof. Dr. Johannes Reichmuth
DLR Institute of Air Transport and Airport Research, German Aerospace Center, German
"Challenges on the way to a sustainable air transport system "
Oct 22 at 11:00 – 11:40

Abstract: The global aviation system is currently facing major challenges. With increasing prosperity in many dense populated regions of the world, rising demand for air transport services is expected. What does this growth mean for the existing infrastructure on the ground and in the airspace globally, regionally and locally? Which approaches are seen to avoid the expected capacity bottlenecks with further growth of aviation? What kind of new aircraft we can expect in the long term. How can the climate impact of aviation be reduced and how can noise and air pollutants be minimized in the vicinity of airports? The presentation tries to give an overview of some possible options for the future development.

Prof. Dr. Johannes Reichmuth is director of DLR Institute of Air Transport and Airport Research and Chair of Air Transport and Airport Research at the Institute of Transport Science of the RWTH Aachen University.
As a physicist at the Max-Planck-Institute for Fluid Dynamics he received his Dr. rer. nat. from the University of Göttingen. At DLR he worked on real-time air traffic management simulations but also on fast time simulations for capacity assessments of airport systems. His research focuses on assessment of air transport system development options and on the airport system as a representative of a multi-modal traffic node. He has been Commissioner of the Performance Review Commission of EUROCONTROL for two periods. He is member of ACARE groups on co-modality, safety and security.

Prof. Dr. Renbiao Wu
Civil Aviation University of China (CAUC), Tianjin, China
"Adaptive Interference Mitigation in Global Navigation Satellite Systems"
Oct 22 at 11:40 – 12:20

Abstract: This talk mainly focuses on adaptive interference mitigation techniques for global navigation satellite systems (GNSS) in the time, domain, spatial and spatial-temporal domains. According to ICAO, GNSS (Global Navigation Satellite Systems) is a key contributor to Performance Based Navigation (PBN). However, the performance of GNSS can easily be impacted by various intentional and unintentional interferences. The various types of interference, including jamming, spoofing, multipath and pulsed interference, and the corresponding adaptive interference mitigation methods for these interferences will be discussed in this talk.

Prof. Dr. Renbiao Wu, vice president of Civil Aviation University of China (CAUC), Tianjin, Professor and Director of the Tianjin Key Lab for Advanced Signal Processing at Civil Aviation University of China. He received his B.Sc. and M.Sc. from Northwest Polytechnic University in 1988 and 1991, respectively, and Ph.D. from Xidian University in 1994, all in electrical engineering. He worked in Imperial College London, University of Florida, and Virginia Tech as Distinguished Research Scholar, Visiting Professor, and Postdoctoral Follow for five years. His research interests include adaptive array signal processing, spectral estimation with their application to GNSS and radar. He has published over 300 papers and ten books or book chapters. He was the recipient of the National Outstanding Young Investigator Award in 2003 in China.

Prof. Dr. Daniel Delahaye
Ecole Nationale de l'Aviation Civile, Toulouse, France
"Mathematical tools for trajectory modeling and design"
Oct 23 at 09:40 – 10:20

Abstract: This talk presents different mathematical tools for trajectory modeling and design. Trajectories are objects belonging to spaces with infinite dimensions. Thus one must develop methods to reduce the dimension in order to allow computers to manipulate such objects (decomposition, Bezier curves, polynomial basis, splines, B-splines, principal component analysis,...). We then present some algorithms for trajectory design based on optimization approaches and wave front propagation. We present also algorithms for trajectory classification based on some trajectory dissimilarity metrics. Finally, some applications are given for the following frameworks:

- Strategic planning (large scale trajectory planning)
- Pre-tactical planning (weather avoidance, congestion reduction)
- Tactical planning (conflict detection and resolution algorithms)
- Airspace Major Flows Extraction
- Non Conformal Approach Detection.

Prof. Dr. Daniel Delahaye is the head of the optimization and machine learning group of the ENAC Laboratory (French Civil Aviation University). He obtained his engineer degree from the ENAC school and did a master of science in signal processing from the national polytechnic institute of Toulouse in 1991. His obtained his
PH.D in automatic control from the aeronautic and space national school in 1995 and did a post-doc at the Department of Aeronautics and Astronautics at MIT in 1996. He got his tenure in applied mathematics in 2012. He conducts researches on mathematical optimization for airspace design and traffic assignment and works on air traffic complexity for more than 12 years with NASA. He is also very active on aircraft trajectory design for strategic, pre-tactical and tactical applications. He collaborates with MIT, Georgia Tech and NASA (USA).

Prof. Dr. Peng Wei
Aerospace Engineering Department, Iowa State University, USA
"Unlock the Personal Sky - Safe and Assured Autonomy for On-Demand Urban Air Mobility"
Oct 23 at 10:50 – 11:30

Abstract: Urban Air Mobility (UAM) is an envisioned air transportation concept, where intelligent flying machines could safely and efficiently transport passengers and cargo within urban areas by rising above traffic congestion on the ground. Aircraft companies such as Boeing, Airbus, Bell, Embraer, Joby, Kitty Hawk, Pipistrel, and Volocopter are building and testing electric vertical take-off and landing (eVTOL) to ensure UAM becomes an integral part of the daily life. Meanwhile, in order to make the UAM operations scalable, new airspace management concepts for highly dynamic and dense air traffic are being studied by NASA, FAA, Uber, Airbus, Embraer (Atech), etc. How can we design and build a real-time, trustworthy, safety-critical autonomous UAM ecosystem to enable large-scale flight operations in high-density, dynamic and complex urban airspace environments? In this talk the speaker will present studies to address this critical research challenge from areas in autonomy, control, machine learning and safety. Our multidisciplinary approach is based on bridging guidance and control, reinforcement learning, and Markov decision process.

Dr. Peng Wei is an assistant professor in Iowa State University Aerospace Engineering Department, with courtesy appointments in Electrical and Computer Engineering Department and Computer Science Department. By contributing to the intersection of control, optimization, machine learning, and artificial intelligence, he develops autonomy and human-in-the-loop decision making systems for air transportation and aviation systems. His current focus is on safety, efficiency, and scalability for both offline and online decision making in uncertain and dynamic environments. Recent applications include: Air Traffic Control/Management (ATC/M), Airline Operations, UAS Traffic Management (UTM), eVTOL Urban Air Mobility (UAM) and Autonomous Drone Racing (ADR). Prof. Wei received his Ph.D. degree in Aerospace Engineering from Purdue University in 2013 and bachelor degree in Automation from Tsinghua University in 2007. He is an associate editor for AIAA Journal of Aerospace Information Systems. He also serves in advisory boards for Airbus UTM and NASA Ames Research Center.

Prof. Dr. Alexandre Gomes de Barros
University of Calgary, Canada
"Connected aircraft - the future of air navigation and traffic control"
Oct 24 at 09:40 – 10:20

Abstract: Conventional air navigation and traffic control systems rely on a centralized system based on radars for traffic monitoring, ground-based navigational aids for navigation, airspace organization into airways and sectors, and air traffic controllers to prevent aircraft from colliding on the air. The last decade has seen a rapid development of new technologies that allow for the decentralization of these systems, transferring responsibility for navigation and collision avoidance to on-board flight management systems. While this transition from centralized to decentralized control promises to bring many improvements in capacity, efficiency and safety, it may also bring unforeseen consequences that will have the exact opposite effect. This presentation introduces the main technologies involved and discusses the most important issues that air traffic service providers will need to address with their advent.

Dr. Alex de Barros has a unique combination of local experience in both Canada and Brazil and global experience on airport planning, economics and regulation. He is a Professor of Transportation Engineering at the University of Calgary, Canada, with research projects on airport and airspace planning and aviation safety. He has an extensive global career having worked on airport projects such as Rio de Janeiro/Galeão, São Paulo/Guarulhos, São Paulo/Viracopos, Toronto/Pearson, Montreal/Trudeau, Atlanta, New York (JFK), Seattle/Tacoma, Hong Kong, Seoul/Incheon and others. He was the Director of Airport Infrastructure of the Brazilian National Civil Aviation Agency (ANAC) between 2007-2010, where he was responsible for the technical activities on regulation and oversight of the Brazilian airport system, including aerodrome design standards, aerodrome operations, passenger terminal operations and security.

Prof. Dr. Annie Liang
University of South Australia (UniSA), Australia
"Application of AI and Machine Learning to Automated Aircraft Sequencing and Merging in TMA"
Oct 24 at 10:50 – 11:30

Abstract: Air traffic congestion is one of the most challenging problems in the current air transportation system. Heavy traffic congestion not only causes economic loss but also pollution. Some new operational concepts were proposed to enhance capacity. Enhancing automation in the tactical and pre-tactical levels of Air Traffic Management (ATM), reducing the controllers' intervention through advanced decision support tools is regarded as an important approach to the digital transformation of the future ATM system. In this presentation, the experience of the application of Artificial Intelligent (AI) and Machine Learning (ML) technologies to solve the congestion in TMA will be shared with the audiences. An interdisciplinary approach is applied to solve the problem. Topics cover the innovation of RNP-based point merge route structure with trajectory clustering, the mathematical optimization formulation in trajectory planning, heuristic algorithm for conflict detection and resolution, and the reinforcement learning approach to solve the intelligent decision-making inside the sub-system. Some experiments under the test condition will be discussed in details. Finally, conclusions and future work will be listed.

Dr. Annie LIANG is a lecturer in the University of South Australia (UniSA). She obtained her Ph.D. degree in Applied Mathematics at the Aeronautics-Astronautics Doctoral School (EDAA), ISAE-SUPAERO & University of Toulouse, in Feb. 2018. Then, she did a short post-doc research in Optimization and Machine Learning Group at ENAC research lab, Toulouse, France. Between 2006 to 2014, she was senior lecturer, researcher and ATC instructor at Civil Aviation University of China, Tianjin, China. She holds the Chinese Air Traffic Control (ATC) license from 2008. Her current research interests include Trajectory-Based Operation, Intelligent Air Traffic Management, An interdisciplinary approach for safe and green flight path, and Unmanned traffic management.

Cel. Antonio Marcio Ferreira Crespo
Concordia University Institute for Information Systems Engineering, Canada
"Carbon Emissions Trading Systems and the Air Transportation Business
Dynamics: Economic Modeling and Impacts Assessment"
Oct 24 at 11:30 – 12:10

Abstract. Environmentally sustainable development is globally recognized as a critical condition for the continuing habitability of the planet, and such fact has been consistently addressed in several international efforts aimed at implementing universally agreed frameworks able to support industry development and protect the environment concomitantly. In such scenario several regions, countries, states and cities designed and implemented market mechanisms targeting GHG emissions reductions and/or financial compensations for above-cap emissions, which includes carbon-trading schemes. And although there exist studies stating that such schemes are amongst the most cost-effective tools for reducing CO2 emissions, the conclusions on the impacts of Emissions Trading Systems (ETS) on air transportation business dynamics are far from being universally agreed upon. As such, the present keynote discusses some of the state-ofthe-art findings regarding the ETS implementation impacts on the air transportation business dynamics.

BSc Aeronautical Sciences by the Air Force Academy and BSc at Federal University of Santa Catarina. Postgrad Diploma by the Aeronautics Institute of Technology. MSc in Computer Science by the University of Brasilia. He served as Executive Secretary of the Commission for the Preparation of the Brazilian Airspace Control System for the FIFA 2014 World Cup, as member of the Special Operations Committee of the National Commission of Airports Authorities, and as Deputy-coordinator of the Olympics 2016 Air Transportation Operations Command and Control Center. Former Air Navigation Commissioner at the International Civil Aviation Organization (ICAO) and Alternate Representative of Brazil to ICAO Council. Also acted as Head of the Operations Planning Division and Executive Secretary of the Project Committee in the Brazilian Department of Airspace Control. Currently Graduate Science Teaching and Learning Fellow and PhD Program Researcher at Concordia University Institute for Information Systems Engineering.

Forum of IT for ATM

Abstract: The Forum of Information Technology for Air Traffic Management in a meeting of the profitionias of academic and industry in civil aviation related the interesting topics of the Information Technology in the application to Air Traffic Management (ATM) in SITRAER. It is in his 12th editions in this year. The main topic is to present the result from the Work Group organized by DECEA - Department of Airspace Control in the Development of System of Wide Information Management (SWIM). Specially to present the DEMO of the application of the SWIM Register.

Ms. Camila Bassetto is the manager of the SWIM Project at the Department of Airspace Control (DECEA). She is also the secretary of the Technical Committee on SWIM (CT-SWIM), which brings together academy, industry, airspace users, air navigation service providers and regulators representatives for joint development of the theme in Brazil. Cartographer Engineer from Universidade Estadual Paulista (UNESP) with a Master's in Public Administration from Fundação Getúlio Vargas (FGV), Camila is a versatile professional, and in her nearly 15 years of experience she has worked in the areas of aeronautical cartography, aeronautical information management, technological innovation and SWIM at the Institute of Aeronautical Cartography (ICA), the Institute for Airspace Control (ICEA) and DECEA.

Prof. Dr. Li Weigang is the chair and Title Professor of the Department of Computer Science in the University of Brasilia (UnB), Brazil. He received his Ph.D. degree from the Technological Institute of Aeronautics (ITA), Brazil, in 1994. He has coordinated TransLab in UnB as the principal investigator (PI) and manager in the cooperation projects with Atech, Boeing R&T/Brazil and Department of Airspace Control (DECEA). As a fellow researcher of Brazilian National Council for Scientific and Technological Development (CNPq), he also leads various projects supported by CAPES, CNPq, FINEP, FAPESP and FAPDF. Prof. Li coordinated SITRAER in Brasilia (2006, 2012 and 2019) and is the president of GT-SWIM with DECEA. He has advised more than 60 students and researchers including undergraduate, master, PhD, and post-doctor researchers. His research interests include artificial intelligence with emphasis on computation model in air traffic management (ATM/SWIM) and data analytics.

SUPPORTS

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