The SESAR KTN – Engage

Overview; delivery in 2019; getting involved in 2020

Prof Andrew Cook, University of Westminster

founding members

Overview

– the SESAR Knowledge Transfer Network

engagektn.com

twitter.com/EngageKTN

Industry partners (+ ...)

Our doors are still open

Advanced Logistics Group (ALG)
AGIFORS - Airline Group of the International Federation of Operational Research Societies
Air Traffic Controllers European Unions Coordination (ATCEUC)
airBaltic
Airport Regions Conference (ARC)
American Airlines
ANS CR
Aslogic
Association for the Scientific Development of ATM in Europe (ASDA)
Autoridade Nacional da Aviação Civil (ANAC)
Barcelona Supercomputing Center (BSC)
Boeing Research and Technology Europe (BR&T-Europe)
Bundesaufsichtsamt für Flugsicherung (BAF)
Civil Aviation Authority (CAA)
COOPANS Consortium
Department for Transport (UK)
Direction des Services de la Navigation Aérienne (DSNA)
Direktorat civilnog vazduhoplovstva Republike Srbije (DCV)
European Meteorological Services Network (EUMETNET)
European Passengers' Federation (EPF)
Executive Airlines
Ferrovial Agroman
Finnair
FlightGlobal
Flughafen München / Munich Airport
Gestair SL
Helios
HEMAV - High Endurance Multipurpose Aerial Vehicles
Honeywell Aerospace
HungaroControl
Icelandair
IFSTTAR - Institut Français des Sciences et Technologies des Transports, de l'Aménagement et des Réseaux
INFORM - Institut für Operations Research und Management GmbH
International Air Transport Passenger Association (IATPA)
International Federation of Air Traffic Controllers' Associations (IFATCA)
International Federation of Air Traffic Safety Electronics Associations (IFATSEA)
Irish Aviation Authority (IAA)
LFV - Luftfartsverket
London Luton Airport
Lufthansa Systems
Manchester Airport
NATS
Naviair
Network Manager - nominated by the European Commission
NEXTOR II Consortium - University of California, Berkeley and University of Maryland
PACE Aerospace Engineering & Information Technology
Pegasus Airlines
QinetiQ Ltd
Raytheon UK
Sabre Airline Solutions
skeyes
SWISS - Swiss International Air Lines
TÜBİTAK - The Scientific and Technological Research Council of Turkey
Turkish Airlines

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Core activities

2018 – 2021

Thematic challenges

- 'One-stop' European knowledge hub, concepts roadmap, research repository

- 4x SESAR Innovation Days (non-disruptive; industry)

- 12 thematic challenge workshops

- 3 European summer schools (Belgrade '19, Luxembourg '20, Trieste '21)

- 10 PhDs (interdisciplinary); 16 catalyst fund projects (TRL pipeline)

- Future ATM skilled work-force; student mobility

  - under-/post-graduate teaching & training initiatives
  - internships & employer links
  - journal publication grants
  - travel grants

35% of €4m as consortium effort

SESAR Digital Academy

Integrate IR and ER

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Thematic challenges

Background

HOME　　ABOUT　　KNOWLEDGE HUB　　PARTICIPATE　　EVENTS　　CONTACTS

Engage Thematic Challenges

At the core of the KTN is the definition of various thematic challenges: new ideas suggested by the research community, not already included within the scope of an existing SESAR project. They are developed along with the ATM concepts roadmap and complementarily with some of the network's PhDs and theses.

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Thematic challenges

Background

website

open invitation

industry partners

COLLABORATIVE DESIGN

dedicated sessions at SIDs

- 16 catalyst funds up to €60k
- (mostly) migration to higher TRL
- 'light touch' – 12 months max
- 2 CF Calls: NOV18 and JAN20
- no further PhD Call (AUG-NOV18)

- 4 thematic challenges in parallel
- dedicated workshops
- alignment with most PhDs

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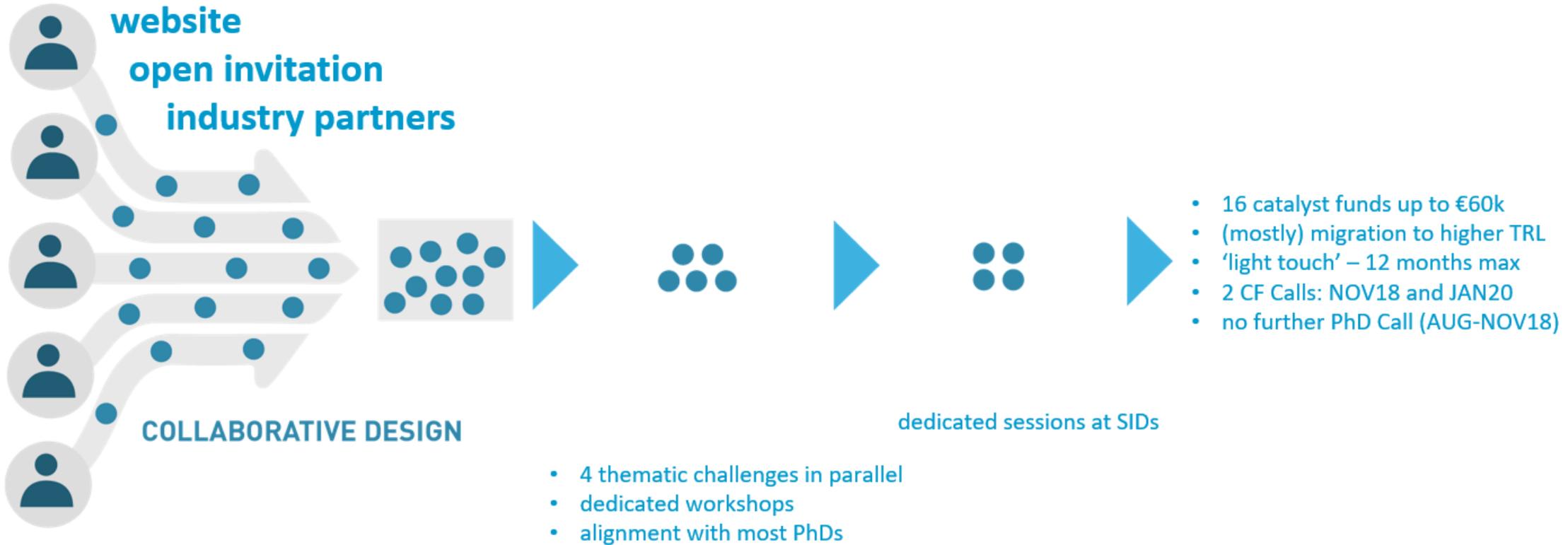
Thematic challenges

Workshops in current rolling window (by challenge number)

Integrate: PhDs, CFs, & wider community

#1. CNS vulnerability and security *Paula López, Innaxis*
17 June 2020, Frequentis, Vienna
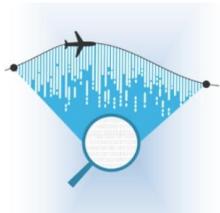
#2. Data-driven trajectory prediction *Dirk Schaefer, EUROCONTROL*
02 December 2019, Athens (co-located with SIDs)

Promotion since August; SESAR e-news

#3. Efficient use of MET data *Tatjana Bolić, Uni. Trieste*
05 November 2019, SJU, Brussels

#4. Novel market mechanisms in ATM *Andrew Cook, Uni. Westminster*
12 November 2019, Nommon, Madrid

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Engage PhDs

10 PhDs launched, up to €150k per thesis (not fees/supervision)

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Title	TC1	TC2	TC3	TC4	Supervisor	Proponent	Inst. 2	Inst. 3	Inst. 4	Co-fund?
Decision support system for airline operation control hub centre ('DiSpAtCH')					Prof Dr-Ing Peter Hecker	TU Braunschweig	Jeppesen			✔
Trajectory planning for conflict-free trajectories: a multi agent reinforcement learning approach ('RL4CFTP')		✔			Prof George Vouros	University of Piraeus Research Center	CRIDA			
Detection, classification, identification and mitigation of GNSS signal degradations by means of machine learning					Prof Nicolas Couellan	ENAC	Uni. Oklahoma			✔
Machine learning techniques for seamless traffic demand prediction	✔				Dr Xavier Prats	Nommon	UPC			✔
Machine learning applications to extend agent's conflict resolution capabilities	✔				Dr Miquel Angel Piera	Autonomous Uni. of Barcelona	ASLOGIC			✔
Integrating weather prediction models into ATM planning ('IWA')	✔	✔			Dr Valentin Polishchuk	Linköping University	LFV	Uni. Sevilla		✔
Advanced statistical signal processing for next generation trajectory prediction	✔				Dr Xavier Prats	Universitat Politècnica de Catalunya	ISAE-SUPAERO			✔
A pilot/dispatcher support tool based on the enhanced provision of thunderstorm forecasts considering its inherent uncertainty ('STORMY')				✔	Dr Manuel Soler	Universidad Carlos III de Madrid	ETH Zürich	Spanish Met Office	GTD Systems	✔
Second generation agent-based modelling for improving APOC operations			✔		Prof Daniel Delahaye	Amsterdam University of Applied Sciences	ENAC	Uni. Paul Sabatier		✔
Stochastic control of tactical airline operations in hub airport networks			✔		Prof Dr-Ing Hartmut Fricke	TU Dresden				

Catalyst funding
10 awards made, up to €60k per project (H2020 limit) – *high value*

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Title	TC1	TC2	TC3	TC4	Lead contact	Coordinator	Inst. 2	Inst. 3	Inst. 4
Authentication and integrity for ADS-B	✓				Prof Dr-Ing Jens Schmitt	TU Kaiserslautern (DE)	SeRo Systems (DE)		
The drone identity - investigating forensic-readiness of U-Space services	✓				Dr Yijun Yu	Open University (GB)	NATS (GB)		
Data-driven trajectory imitation with reinforcement learning		✓			Prof George Vouros	University of Piraeus (EL)	Boeing RTE (ES)		
A Data-drIven approach for dynamic and Adaptive trajectory PredictiON (DIAPasON)		✓			Jose Manuel Cordero	CRIDA (ES)	Deep Blue (IT)	ZenaByte (IT)	
An interaction metric for an efficient traffic demand management: requirements for the design of data-driven protection mechanisms		✓			Dr Juan José Ramos	Aslogic (ES)			
Probabilistic weather avoidance routes for medium-term storm avoidance (PSA-Met)			✓		Prof Damián Rivas	University of Seville (ES)	MeteoSolutions (DE)		
Airport-sCAle seveRe weather nowcastinG project (CARGO)			✓		Dr Riccardo Biondi	University of Padova (IT)	LMU Munich (DE)	GReD srl (IT)	Leonardo (DE)
Operational alert Products for ATM via SWIM (OPAS)			✓		Dr Hugues Brenot	Royal Belgian Institute for Space Aeronomy (BE)			
MET enhanced ATFCM			✓		Gladys Mercan	DSNA Services (FR)	MetSafe (FR)		
Exploring future UDPP concepts through computational behavioural economics				✓	Ricardo Herranz	Nommon Solutions and Technologies (ES)			

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Thematic challenges
Taking stock

	TC1	TC2	TC3	TC4
PhDs	-	5	2	2
Catalyst fund projects	2	3	4	1

Delivery in 2019

Belgrade summer school
Dissemination for 2019

Belgrade summer school

Summer school 2019

Belgrade summer school
Summer school 2019

- 32 registered participants from 14 countries:
  - Belgium (2); Bulgaria (1); France (2); Germany (3); Greece (2); Italy (1); Norway (1); Serbia (5); Singapore (1); Spain (7); Sweden (1); The Netherlands (3); Turkey (1); UK (2)

- Predominantly mixture of full-time/part-time students and young researchers
  - 23 PhD, 8 MSc, 1 BSc; some industry delegates

- Engage financially supported travel/accommodation of 17 students
  - including all Engage PhDs (in addition to scholarship funds)
  - 9 / 10 Engage PhDs participated
  - each presented their topic to stimulate discussion and receive technical feedback

- Lecture topics pre-selected by Engage PhD supervisors (May 2019)

- Lectures from five Engage consortium members; meeting with KTN mentors

- Content development in years 3 and 4 (2020 slide later)

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'GEN-INTRO' training places

Training in 2019

- EUROCONTROL, Institute of Air Navigation Services (IANS), Luxembourg
  - two-day immersive experience at ATCO control position
  - real-time simulator under guidance of qualified controllers
  - using realistic traffic and pseudo pilots

- 22-23 October 2019

- Priority to Engage PhD candidates (4 places) & catalyst fund projects (2 places)
  - places filled quickly
  - very positive feedback

- More places in May 2020 (slide later)

'One-stop' European knowledge hub
Concepts roadmap, research repository – core legacy

Forthcoming opportunities

Forthcoming opportunities

Getting involved in 2020

- Second Call for catalyst funding

- Technical workshops

- 'GEN-INTRO' training places

- Thematic challenge workshops

- Second summer school

- Journal publication grants

- Travel grants

- Internships & employer links

- *SESAR Digital Academy*
  - *future ATM skilled work-force; student mobility – several synergies*

Second Call for catalyst funding

Getting involved in 2020

January 2020 (possibly early in the month)

Also on Commission's Participant Portal

Engage consortium ineligible; €60k limit; very similar to previous Call; TC or 'open'; FAQs

Engage website

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Technical workshops
Getting involved in 2020

09/10 March 2020 (TBC; World ATM Congress)

Madrid – **others announced ASAP**; may be co-located with demand (ER4?); industry-oriented?

Limited places, priority to Engage PhD candidates & catalyst fund projects; plus experts

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'GEN-INTRO' training places

Getting involved in 2020

05-06 & 07-08 May 2020 (possibly more in 2021)

EUROCONTROL, Institute of Air Navigation Services (IANS)

6 further places, priority to Engage PhD candidates & catalyst fund projects

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Thematic challenge workshops

Getting involved in 2020
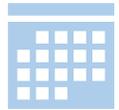
17 June 2020: CNS vulnerability and security (other workshops later in year; SIDs)
(avoiding ICRAT)

Vienna (hosted by Frequentis)

Open to all

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Second summer school

Getting involved in 2020
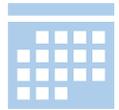
w/c 06 July 2020

EUROCONTROL, Institute of Air Navigation Services (IANS)

Open to all, appx. 30 places, priority to Engage PhD candidates & catalyst fund projects

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Journal publication grants
Getting involved in 2020

Journal of Air Transport Management

Supports *open access*

Latest issue   Article collections   All issues   Submit your article ↗

In progress (e.g. SIDs 2018 Special Issue?)

Gold Open Access fees; no journal prioritisation *per se*

SIDs Special Issue -> PhD candidates (reserve) -> catalyst fund projects -> open

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Travel grants
Getting involved in 2020

On-going (exploring further internal fund allocation)

Engage events

**Aimed at students who could not otherwise attend** (simple form)

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Internships & employer links
Getting involved in 2020
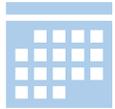
On-going (could peak from January 2020 – ER4 announcement?)

Mostly European opportunities

Open to all (so far)

Vacancies

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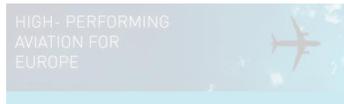
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Thank you

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