AfIA
Association française
pour l'Intelligence Artificielle

PFIA 2021

NATO Military Uses of Artificial Intelligence, Automation, and Robotics

Benoit Le Blanc et Hervé Le Guyader, ENSC, Bordeaux.
François du Cluzel, NATO ACT Innovation Hub, Norfolk, Virginia.

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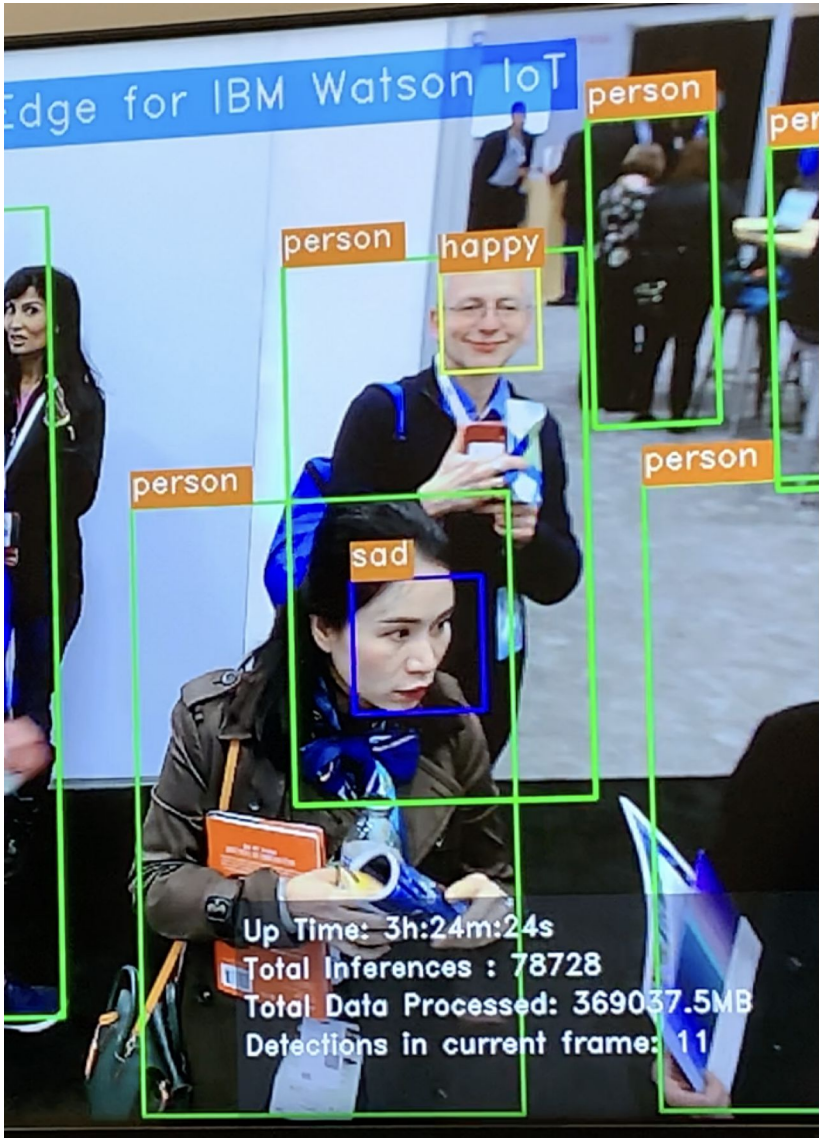
INNOVATION HUB

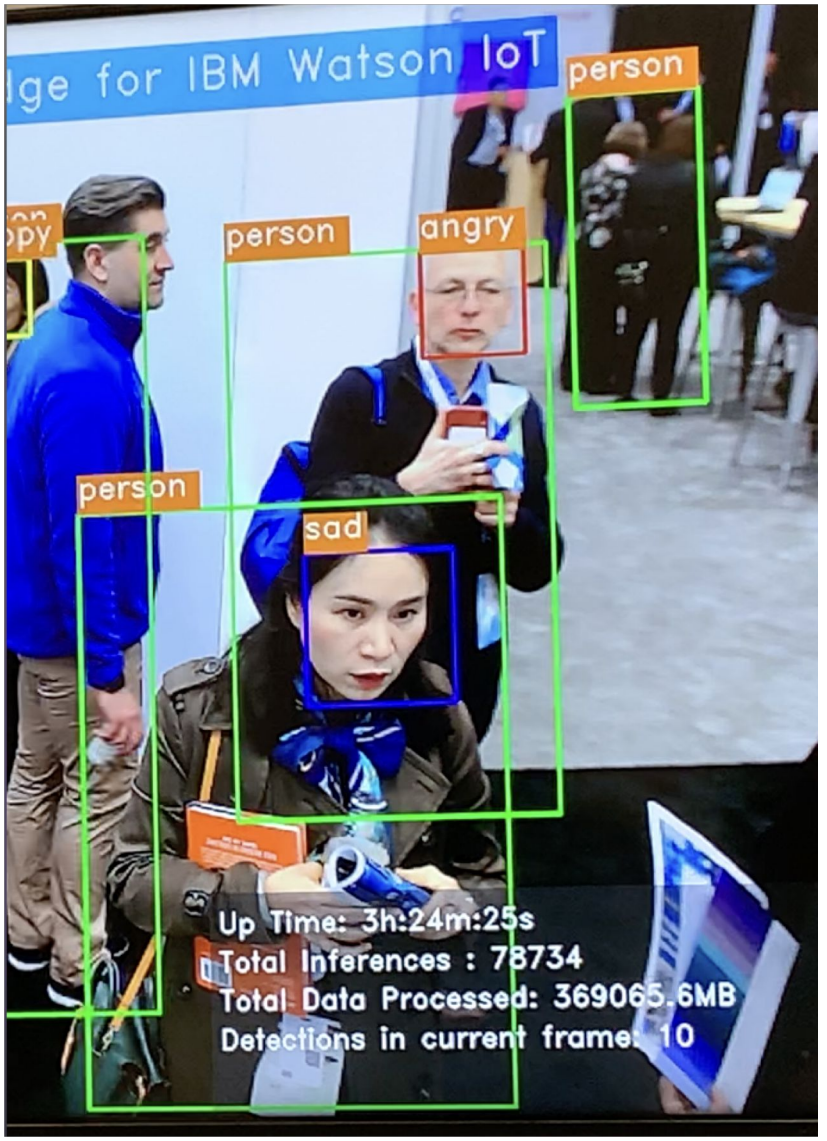
IA : un état des lieux

Capacité à reconnaître une forme, un motif, dans un flux continu de données (vidéos, sons, images, textes, paroles, mouvements, etc.).

Installation de capteurs d'information dans le quotidien des personnes, Constitution de bases d'exemples pour une automatisation des décisions (diagnostic),Elaboration de services ou produits liés à la traduction, à la transcription ou encore à l'élocution.

Approche interdisciplinaire de l'IA, Fertilisation croisée du domaine, par la Recherche et l'Economie.





Démonstration Nutanix Xi Edge
Salon IBM Think
San Francisco - Février 2019

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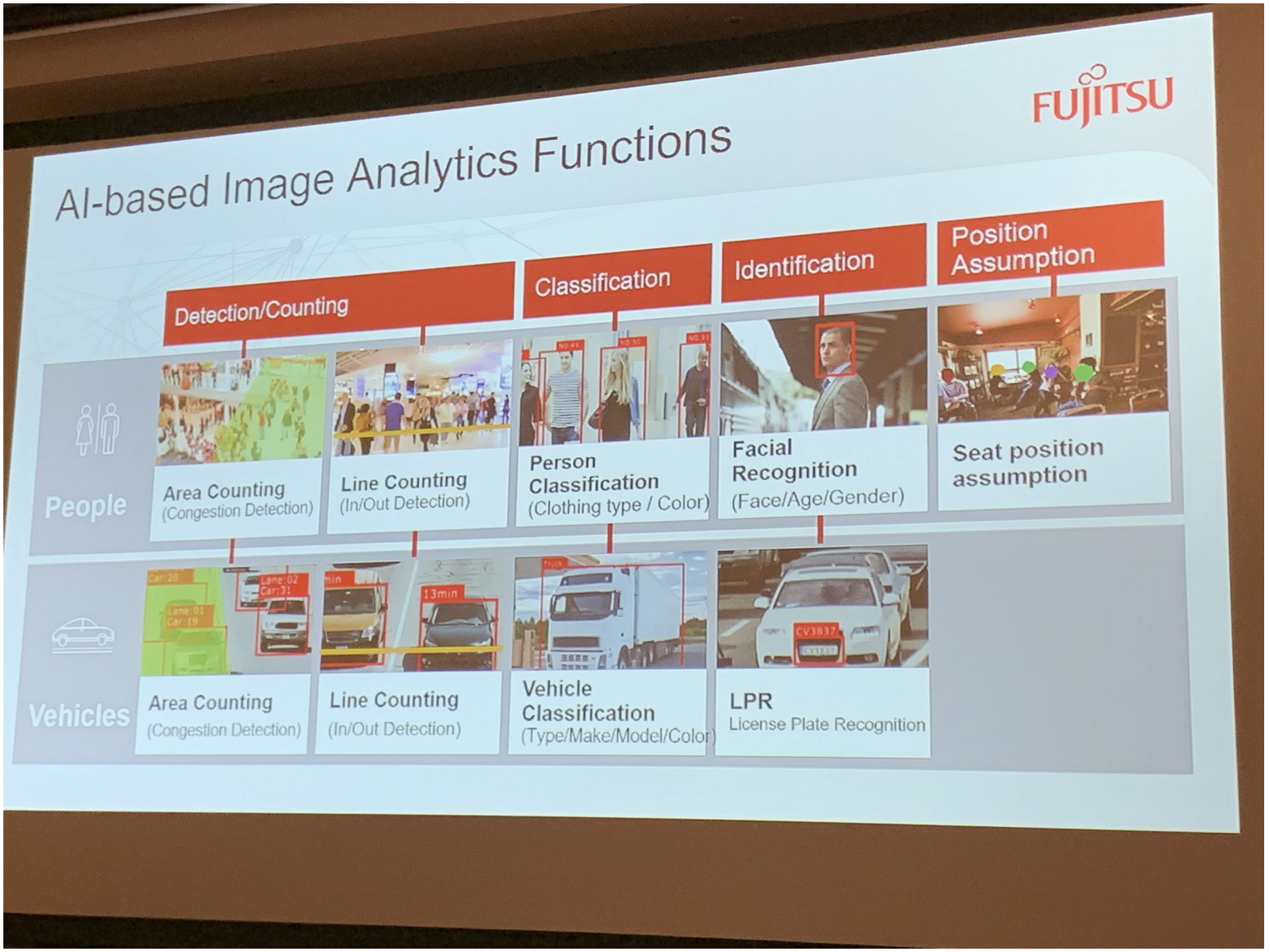

Exposé de la société Fujitsu
Symposium Japon-Allemagne-France sur l'IA
DWIH - Tokyo - Novembre 2018

Rapport de synthèse – France IA

État des lieux de l'intelligence artificielle en France

***

On regroupe habituellement sous le terme d'« intelligence artificielle » un ensemble de notions s'inspirant de la cognition humaine ou du cerveau biologique, et destinés à assister ou suppléer l'individu dans le traitement des informations massives. Longtemps restée l'apanage des films et romans de science-fiction, l'intelligence artificielle émerge véritablement dans notre quotidien et devient progressivement une réalité. Si la Chine et les Etats-Unis se positionnent aujourd'hui en leader en matière d'intelligence artificielle, la France n'est pas en reste et a de nombreux atouts à faire valoir en matière de recherche, de formation, de transfert technologique et de création d'entreprises innovantes. Autant d'atouts qui lui permettent de disposer d'un écosystème potentiellement propice à l'émergence de véritables « champions de l'intelligence artificielle ».

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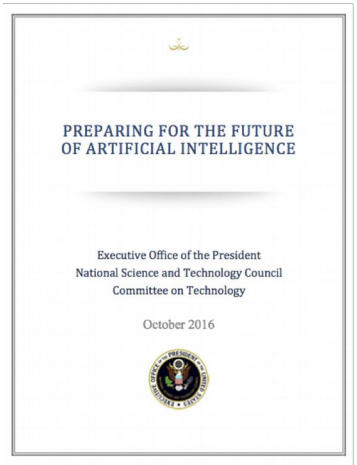

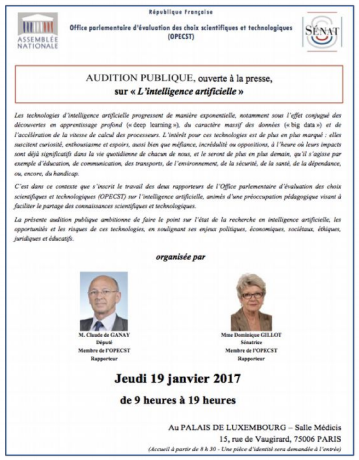

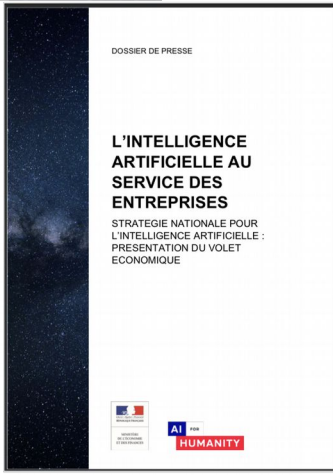

oct. 2016 / mars 2017 / avril 2017

mars 2018 / nov. 2018 / juill. 2019

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La stratégie française

IA POUR L'HUMANITÉ

1
Les talents
Disposer de la meilleure expertise en intelligence artificielle

Recherche :
3IA : Grenoble, Nice, Paris, Toulouse
30 chaires hors 3IA
200 contrats doctoraux
AAP lancés par l'ANR

2
La diffusion
Diffuser l'intelligence artificielle dans l'ensemble de l'économie et de l'administration

Economie :
Actions dans l'administration
Filières industrielles
Réseau DGE innovation
Grands défis

3
L'éthique
Engager un dialogue entre performance et humanité

Société :
GPAI confié par le G7 à l'OCDE
GFAIH, fin octobre à Paris

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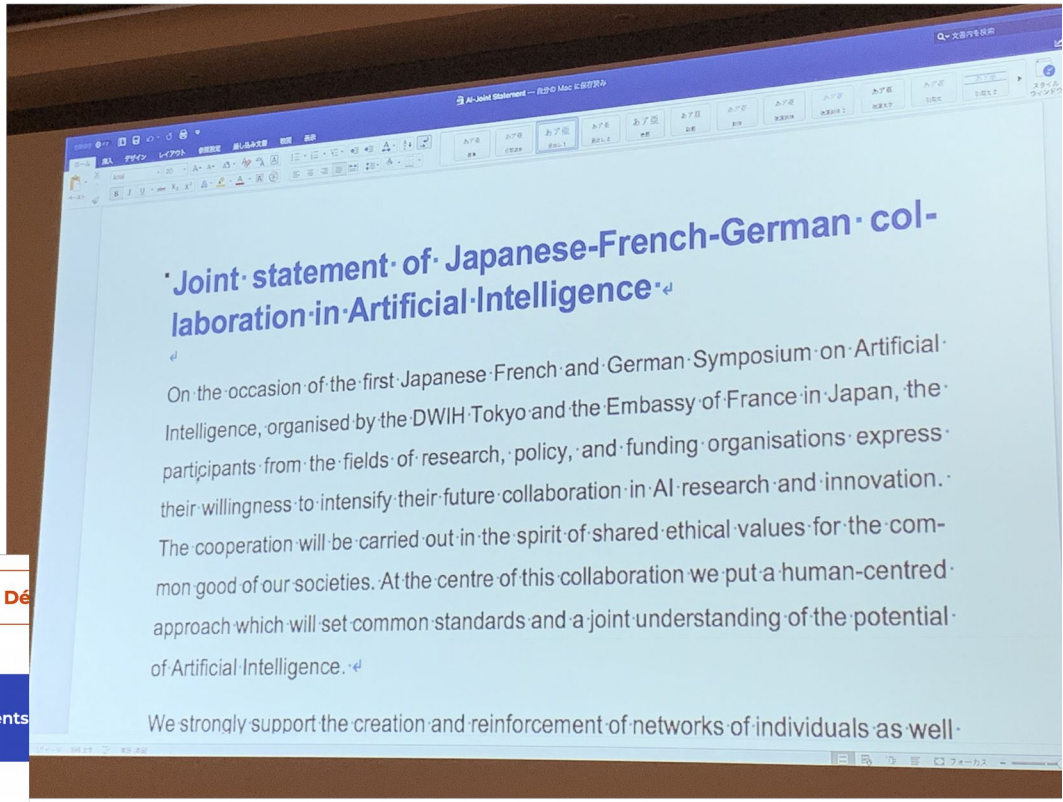
Tokyo – novembre 2018



ANR AGENCE NATIONALE DE LA RECHERCHE

ACTEURS DE PROJETS DE RECHERCHE | INSTITUTIONS PUBLIQUES OU PRIVÉES | JOURNALISTES

L'ANR et la recherche | Appels à projets | Projets financés et impact | Investissements

26/10/2020

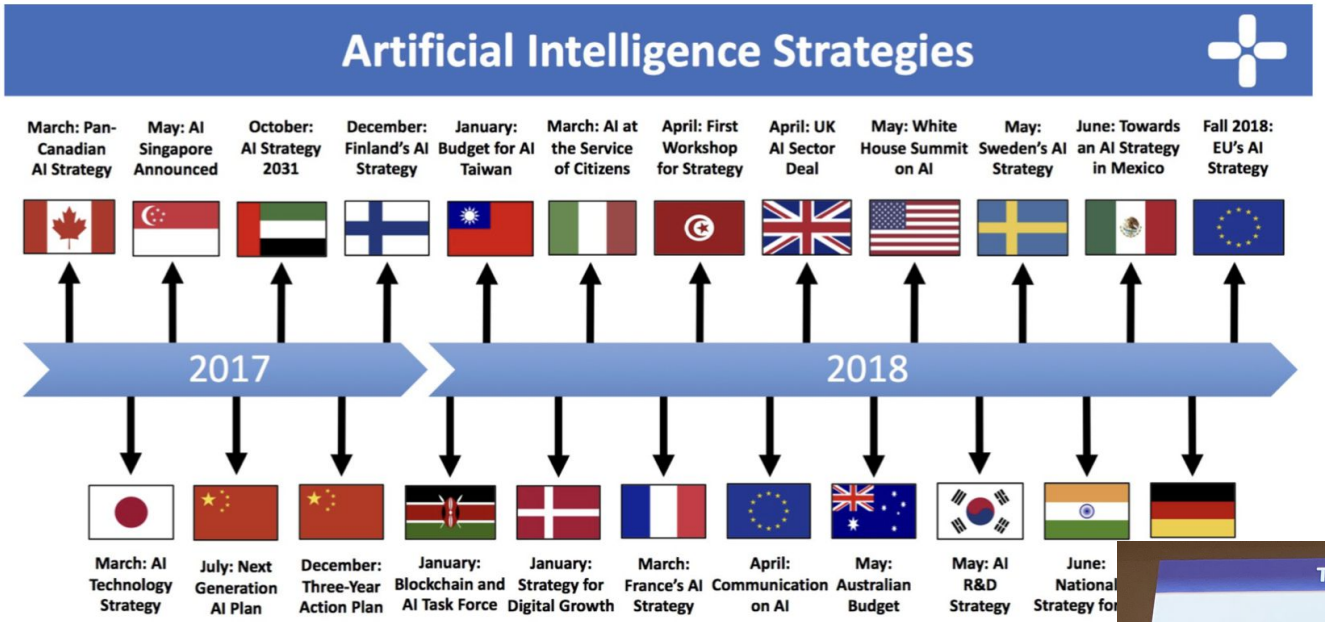
Intelligence artificielle : découvrez les projets sélectionnés dans le cadre de l'appel franco-germano-japonais

4 domaines stratégiques :

- Transport / Mobilité
- Santé
- Environnement
- **Défense / Sécurité**

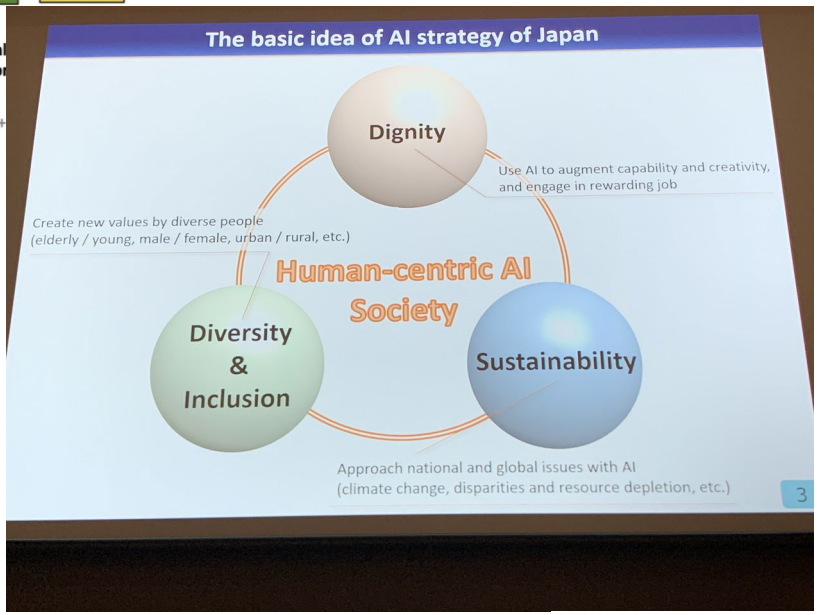
Tim Dutton Follow

Jun 28, 2018 · 25 min read



https://medium.com/politics-ai/an-overview-of-national-ai-strategies-2a70ec6edfd

Voir aussi https://www.holoniq.com/notes/50-national-ai-strategies-the-2020-ai-strategy-landscape/



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https://www.nato.int/nato_static_fl2014/assets/pdf/2020/4/pdf/190422-ST_Tech_Trends_Report_2020-2040.pdf

Science & Technology Trends 2020-2040

Exploring the S&T Edge

NATO Science & Technology Organization

EDT: Emerging & Disruptive Technologies
big data, artificial intelligence, quantum technologies, autonomous systems, space, biotechnologies and hypersonic weapons

Conjecture Card: Artificial Intelligence

B.1 Detect/Generate Fake Media

Automatically detect or create fake media reports, video, audio and social media posts responsive to live situations or to communicate in real-time with targeted individuals or groups.

B.2 Virtual Command Advisor

Support and advise operational commanders in real-time with human-like reasoning and advice based on previous operations, leveraging comprehensive operational awareness.

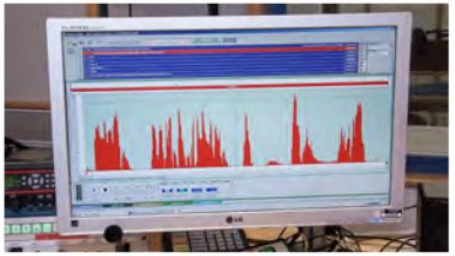
B.3 Automated Communication

Equip individual soldiers to automatically, instantly identify and accurately translate languages, body language and human emotions anytime and anywhere.

B.4 Spoof AI Systems

Covertly get in-side the OODA loop of adversary's AI systems to insert misleading data or information to impact their decision-making processes.

B.5 Deep Fakes



Modify and mimic adversarial communications, including those in real-time (video, audio, etc.) to destroy trust.

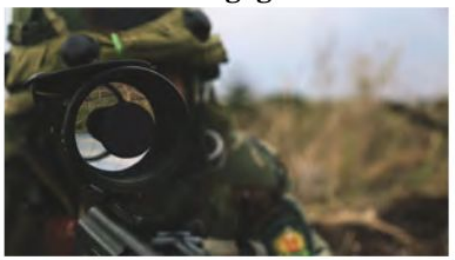
B.6 Optimise Vehicle Use

Optimally allocate and route vehicles (e.g. transport, medevac, ISR, tanks, APC, etc.) using real-time situational awareness of the operating environment.

B.7 Disruptive Behaviour

Accurately predict the behaviour of humans or groups from background data (e.g. social media, surveillance, biometric devices).

B.8 Precision Engagement



Acquire and engage targets in a crowded, cluttered or dynamic environment with highly localised-effects (kinetic or energy-based) and selective lethality.

B.9 Automated Targeting

Provide precision targeting advice, across the military, economic, information, and diplomatic spectrum to achieve a desired operational/strategic effect.

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L'**Organisation pour la science et la technologie** (*Science and Technology Organization*, STO) est un organisme civil de l'Organisation du traité de l'Atlantique nord (OTAN ou *NATO*) chargé de la recherche scientifique et technologique. Elle est issue de la fusion en 2012 du comité pour la science et la technologie (*Science & Technology Board*, STB) et du Centre de recherche sous-marine de l'OTAN (*NATO Undersea Research Center*, NURC). Elle se compose du STB, de comités scientifiques et techniques et d'organes exécutifs.

Organisation [modifier | modifier le code]

La STO[1,2] est présidée par un conseiller scientifique qui est basé au siège de l'OTAN, à Bruxelles, la gouvernance organisationnelle étant du ressort du STB. Le conseiller scientifique est à la fois président du STB et conseiller scientifique principal auprès du Conseil de l'Atlantique Nord.

Les membres des comités scientifiques et techniques viennent d'organismes nationaux et d'organismes OTAN. Ils dirigent et exécutent les activités de coopération.

Le soutien exécutif et administratif de ces activités est assuré par le Bureau de soutien à la collaboration (*Collaboration Support Office*, CSO), anciennement Agence pour la recherche et la technologie (RTA), implanté à Neuilly-sur-Seine.

Le Centre pour la recherche et l'expérimentation maritimes (*Centre for Maritime Research and Experimentation*, CMRE), anciennement NURC, installé à La Spezia (Italie)[3], organise et mène des recherches scientifiques et des activités de développement technologique axées sur le domaine maritime.

La STO repose sur six groupes thématiques et deux groupes transverses[4] :

- *Applied Vehicle Technology*, AVT,
- *Human Factors and Medicine*, HFM,
- *Information Systems Technology*, IST,
- *System Analysis and Studies*, SAS,
- *Systems Concepts and Integration*, SCI,
- *Sensors and Electronics Technology*, SET,
- *NATO Modelling and Simulation Group*, NMSG,

Organisation pour la science et la technologie

Cadre

Type	Organisation
Pays	Belgique France
Coordonnées	48° 53′ 17″ N, 2° 16′ 07″ E

Organisation

Site web	www.rto.nato.int

modifier - modifier le code - modifier Wikidata

WIKIPÉDIA
L'encyclopédie libre

IA pour la défense

- Détecter

  reconnaissance d'une forme

- Viser

  signaux & triangulation

- Engager

  décision

  suivi de trajectoire

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INNOVATION HUB

1st International Conference on Autonomous Intelligent Cyber-Defence Agents (AICA 2021), 15-16 March 2021

In the future, we will be faced with hugely complex networks, which include systems and infrastructures, and the anticipated huge growth of safety-critical autonomous systems. Human operators will not be in a position to monitor the cybersecurity of these assets and will not be able anymore to respond to cyber-attacks at the speed, scale and level of complexity needed. Autonomous intelligent cyber-defence Agents - AICA agents - will be a key enabler of our future military networks, devices and combat doctrines. With its duality, the AICA technology will defend both civil and military networks and systems (IoT, SDN, 5G, Autonomous vehicles, etc.).

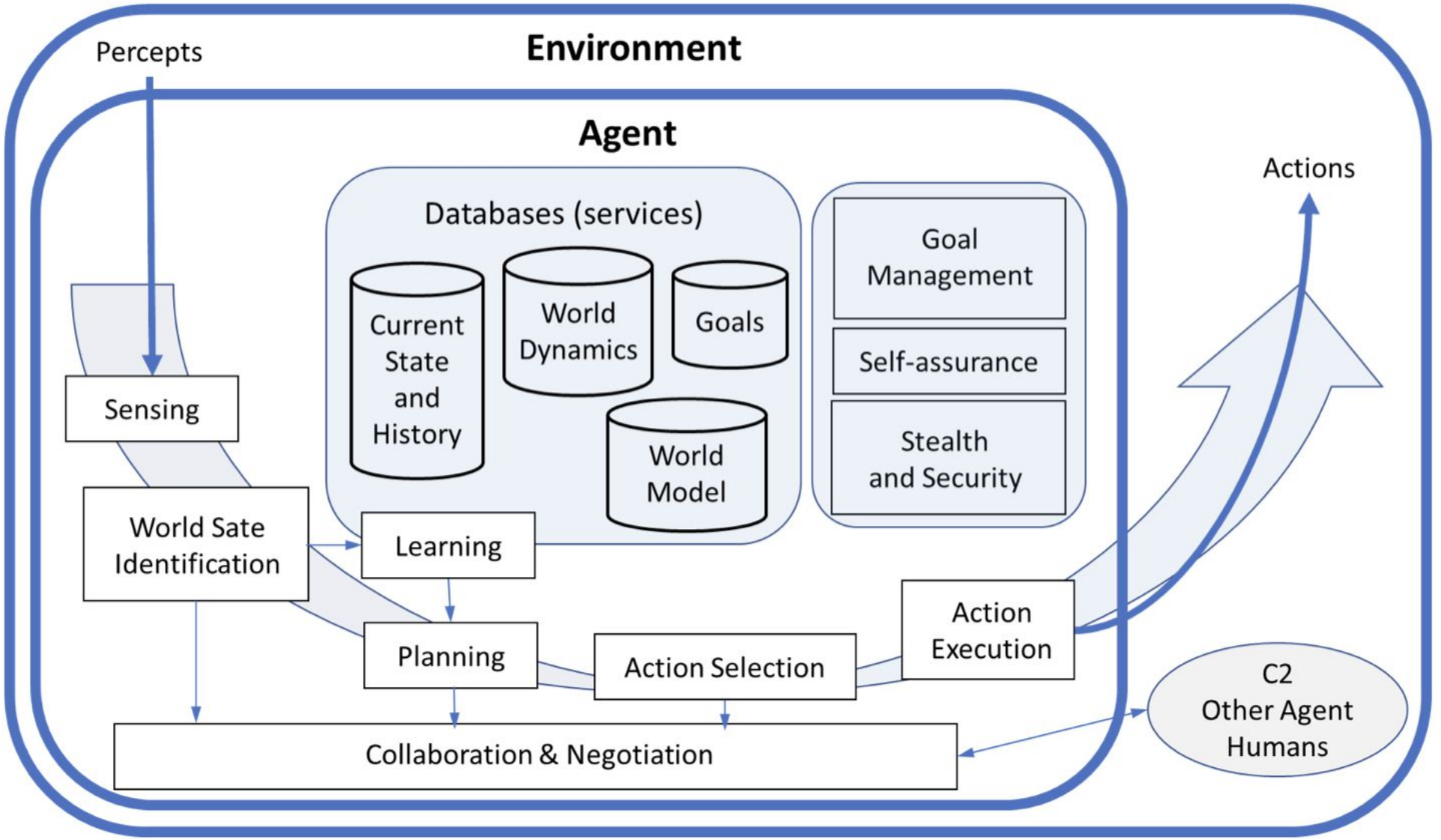
As a follow-on event of the IST-152 Research Task Group on ‘’Intelligent, Autonomous and Trusted Agents for Cyber Defense and Resilience’’, the first International Conference on Autonomous Intelligent Cyber-Defence Agents, which will virtually take place on 15 and 16 March 2021, will present the state of the art in Autonomous Cyber Defence. The Call for Papers has been published and the deadline for the submission of papers is 15 January 2021.

The outcomes of the conference will feed future research and contribute to creating a wider AICA research & technology community.

For further information, check out the AICA 2021 website or contact the IST Panel Office.

Published 2021-01-06T23:00:00Z by IST

AICA (IST 152)


Percepts
Environment
Agent
Actions
Databases (services)
Current State and History
World Dynamics
Goals
World Model
Goal Management
Self-assurance
Stealth and Security
Sensing
World Sate Identification
Learning
Planning
Action Selection
Action Execution
C2
Other Agent
Humans
Collaboration & Negotiation

[Submitted on 28 Mar 2018 (v1), last revised 18 Sep 2019 (this version, v2)]

Autonomous Intelligent Cyber-defense Agent (AICA) Reference Architecture. Release 2.0

Alexander Kott, Paul Théron, Martin Drašar, Edlira Dushku, Benoît LeBlanc, Paul Losiewicz, Alessandro Guarino, Luigi Mancini, Agostino Panico, Mauno Pihelgas, Krzysztof Rzadca

This report - a major revision of its previous release - describes a reference architecture for intelligent software agents performing active, largely autonomous cyber-defense actions on military networks of computing and communicating devices. The report is produced by the North Atlantic Treaty Organization (NATO) Research Task Group (RTG) IST-152 "Intelligent Autonomous Agents for Cyber Defense and Resilience". In a conflict with a technically sophisticated adversary, NATO military tactical networks will operate in a heavily contested battlefield. Enemy software cyber agents - malware - will infiltrate friendly networks and attack friendly command, control, communications, computers, intelligence, surveillance, and reconnaissance and computerized weapon systems. To fight them, NATO needs artificial cyber hunters - intelligent, autonomous, mobile agents specialized in active cyber defense. With this in mind, in 2016, NATO initiated RTG IST-152. Its objective has been to help accelerate the development and transition to practice of such software agents by producing a reference architecture and technical roadmap. This report presents the concept and architecture of an Autonomous Intelligent Cyber-defense Agent (AICA). We describe the rationale of the AICA concept, explain the methodology and purpose that drive the definition of the AICA Reference Architecture, and review some of the main features and challenges of AICAs.

Comments:	This is a major revision and extension of the earlier release of AICA Reference Architecture
Subjects:	**Cryptography and Security (cs.CR)**
Report number:	ARL-SR-0421
Cite as:	arXiv:1803.10664 **[cs.CR]**
	(or arXiv:1803.10664v2 **[cs.CR]** for this version)

AICA IWG

Bordeaux INP ENSC

Introducing IST-157

Human considerations in AI for C2

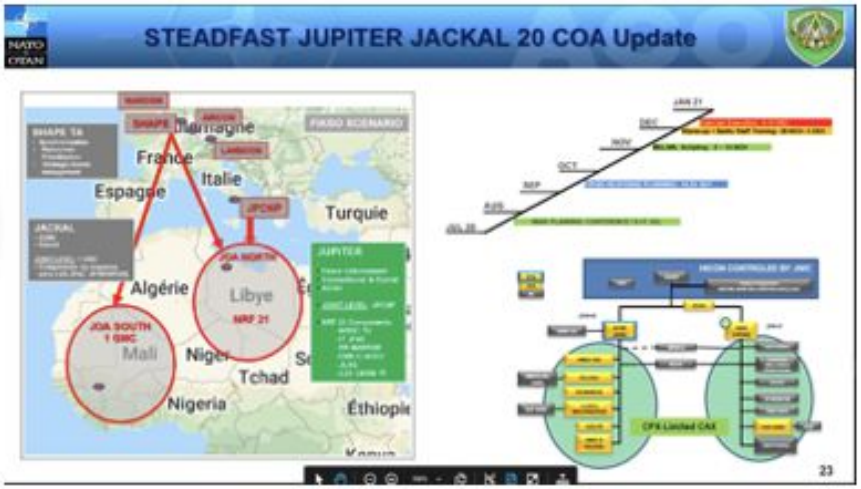
Keywords: Artificial Intelligence, C2, Human in the loop, Trust, CCIR, STJU-JA20

modest, but not without ambition

What is being done?

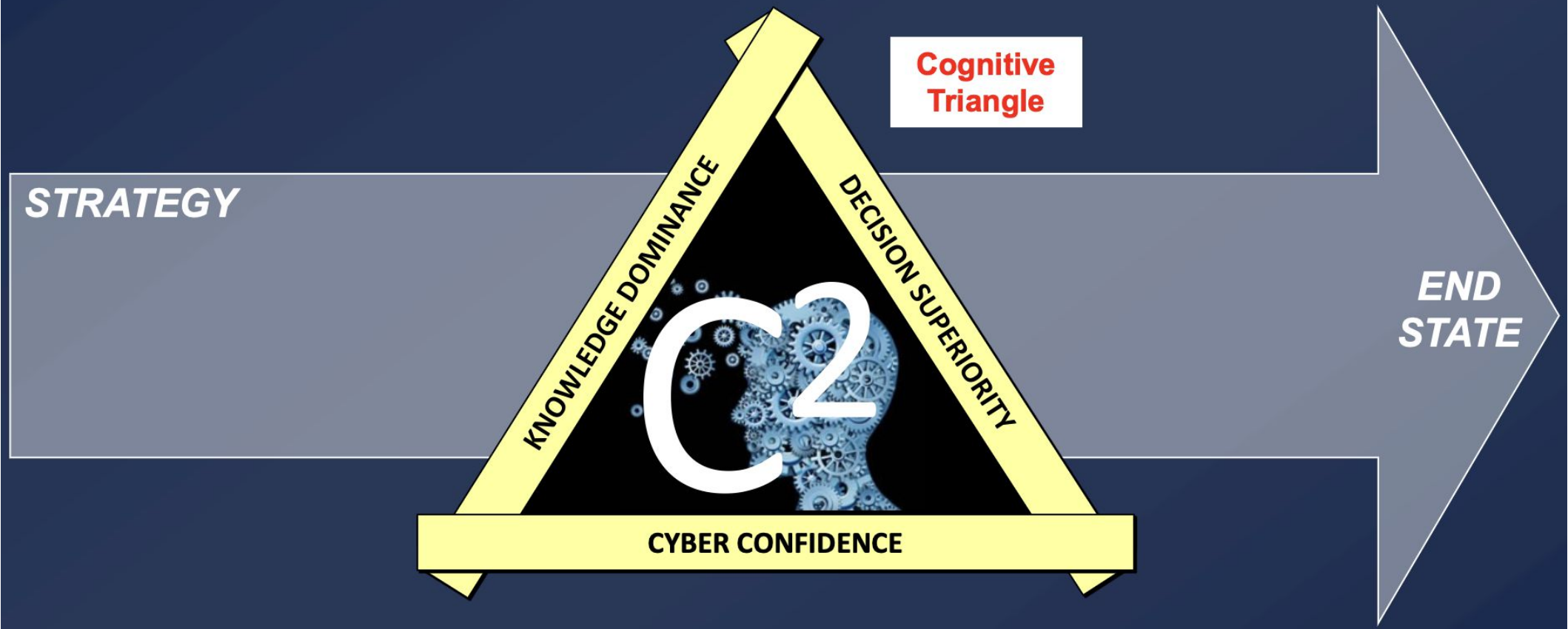
Two main strands:

- ***A report**, due by 11th July, 2021, made of 8 chapters written collaboratively, with synthesis by chapters' Leaders*
- ***The participation to a NATO exercise**: STJU-JA20, 4-10 December, 2020 in Naples, with a prototype tool, "ANTICIPE", focusing on CCIR.*



Chapter's title
Executive summary/BLUF
HCinAI4C2 visibility
OODA loop, as demonstrator
OODA loop, as field of research
Cyber
Developer's view
A bigger picture
ANTICIPE @ STJUJA20
STJUJA20 retex

C2 vision



- A theoretical "machine" in support of a strategy.
- Processes, methods and knowledge management techniques as the C2 "cognitive Triangle"
- Successful C2 relying on 3 pillars: information dominance, decision superiority and cyber confidence.

2 overarching processes

GDC2
Gilles Desclaux Consulting Coaching

S2T

STRATEGY → OBJECTIVES → EFFECTS → ACTIONS → TASKS

ASSESSMENT

Feedback

STRATEGY to TASK

AI

DATA to DECISION

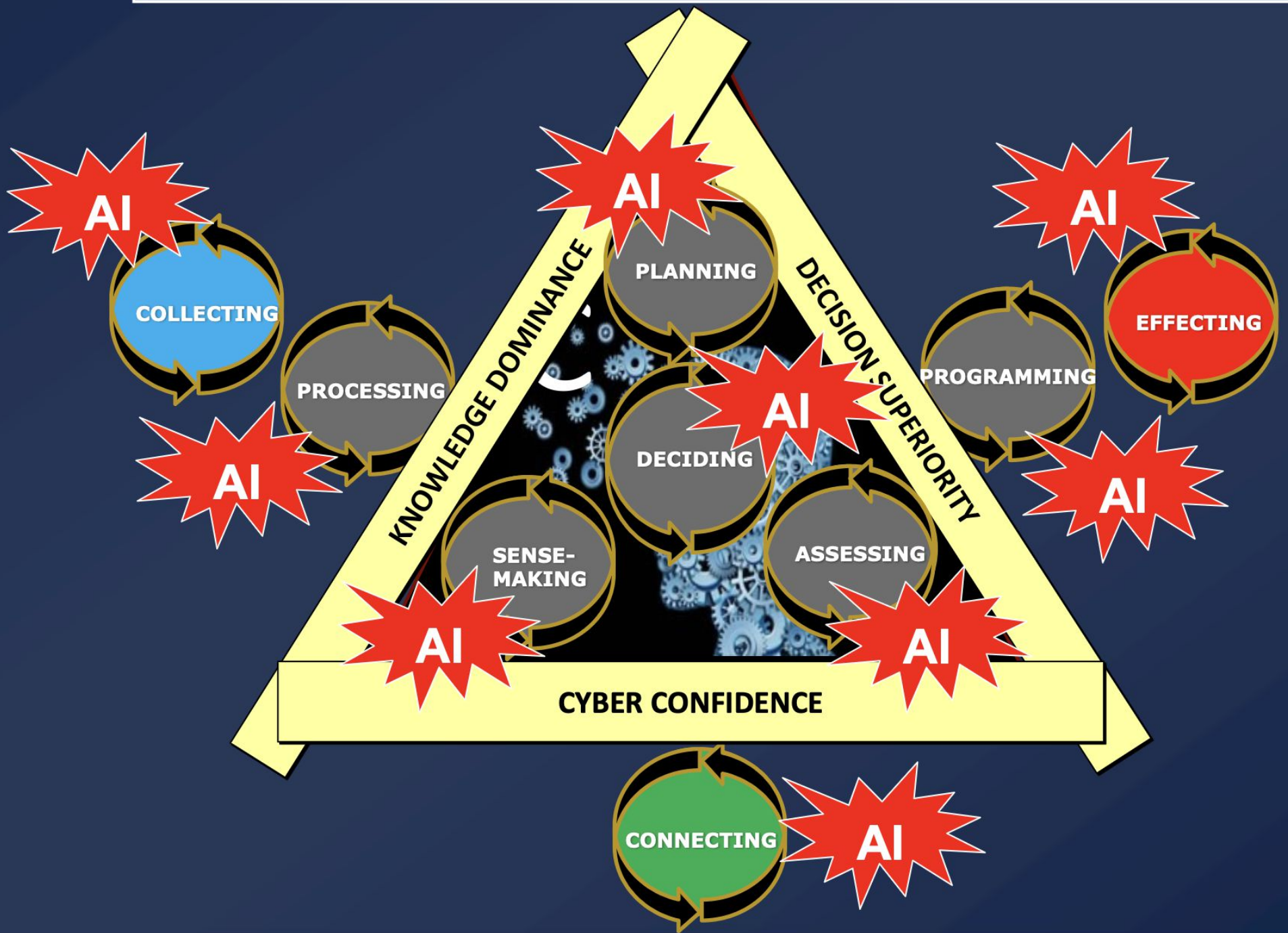
D2D

DATA → INFORMATION → KNOWLEDGE → DECISION → EXECUTION

BDA

Feedback

Mastering AI Impact is essential



Academia / Industry / Defense

Multidisciplinary Project

THALES

ThalesRaytheonSystems

LA RUCHE THALES

Bordeaux INP ENSC

HEAL

ACCS

NATO OTAN

ANTICIPE

Engineering University for Applied Cognitive Sciences

NATO OTAN S&T

IST-157

Augmented Near real-Time Instrument for Critical Information Processing and Evaluation

ANTICIPE EXPERIMENTATION

ST JUJA 20: NATO (NRF) Certification Exercise (Cancelled due to COVID)
ST JU 22: April 2022 (CRP) to September 2022 (Execution)

! Allied Command Transformation NORFOLK Sponsorship

Aim: To explore how, using an AI-enabled technology prototype, Command & Control decision making is affected in an operational setting.

IST 157 research Team study:

- confidence in AI,
- impact on SA (Ind. & Team),
- cognitive workload ,
- integration human / system.

Largest possible UX study

FIKSO Scenario

! Team: US (AFRL, NIWC), GE, BUL, CAN, UK, FR

Shameless plug

Weaponization of neurosciences

Hervé LE GUYADER

Ecole Nationale Supérieure de Cognitique, Bordeaux, FRANCE

February 2020

September 2020

Innovation @ ACT

SACT's Understanding & Vision

- **Innovation is the implementation of new and/or different ideas, methods or solutions that achieves value for the Alliance.**
- Two lines of innovation are to be considered and combined:
  - **traditional defence "mainstream" innovation** ("pushing" the development of military technologies) **["directed" innovation]**
  - **open innovation** ("pulling" innovation coming from the civilian world to the benefit of military applications, to leverage them at the speed of relevance).

ACT Open Innovation

- ACT's ambition: **to provide a robust incubation environment** for military, academia and industry to **fast-track applications of innovative operational models AND emerging technologies**

- Creation of Innovation Branch at HQ SACT by expanding existing **Innovation Hub** to include increased **Innovation Lab capabilities**
  - **Innovation Hub (IH):** Open Innovation for NATO and NATIONS
  - **Lab Capability**: expansion of IH with a DevSecOps software pipeline, with USAF KesselRun as an example

Innovation Hub with Lab capability

Collaborative solution development and testing by Hub open community
(3000 experts from Industry, Academia, Government, IO/NGOs and the Public)

Open Innovation

Issues, questions

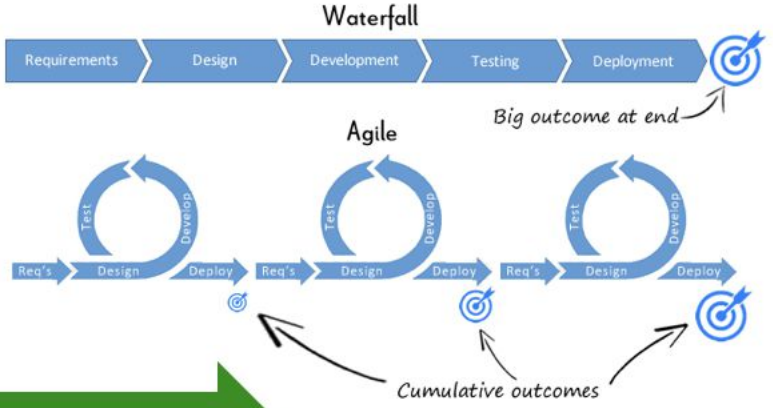
Draft solutions, concepts
CoAs, Recommendations

MVPs* Proposals

MVPs*

NEW
DevSecOps

Enabled by



*MVPs – Minimum Viable products delivered as Experimental Fielded Prototypes and/or Technology Demonstrators

months+

ACT - Improving today, Shaping tomorrow, Bridging the two

Innovation Hub, network & Challenges

Open Innovation for NATO and NATIONS

- UNDERSTAND environment and issues
- DESIGN concepts and solutions
- DEVELOP prototypes

Experts Community who Collaborate through Modern Tech/ tools and Deliver Innovative Solutions

3500 members / 72 Nationalities

NATO Innovation Challenges

- Open-ended problem statement
- To be conducted on a bi-annual basis in different NATO Nations
- Free participation
- Remote/online participation

Focus on Hub – leveraging open innovation

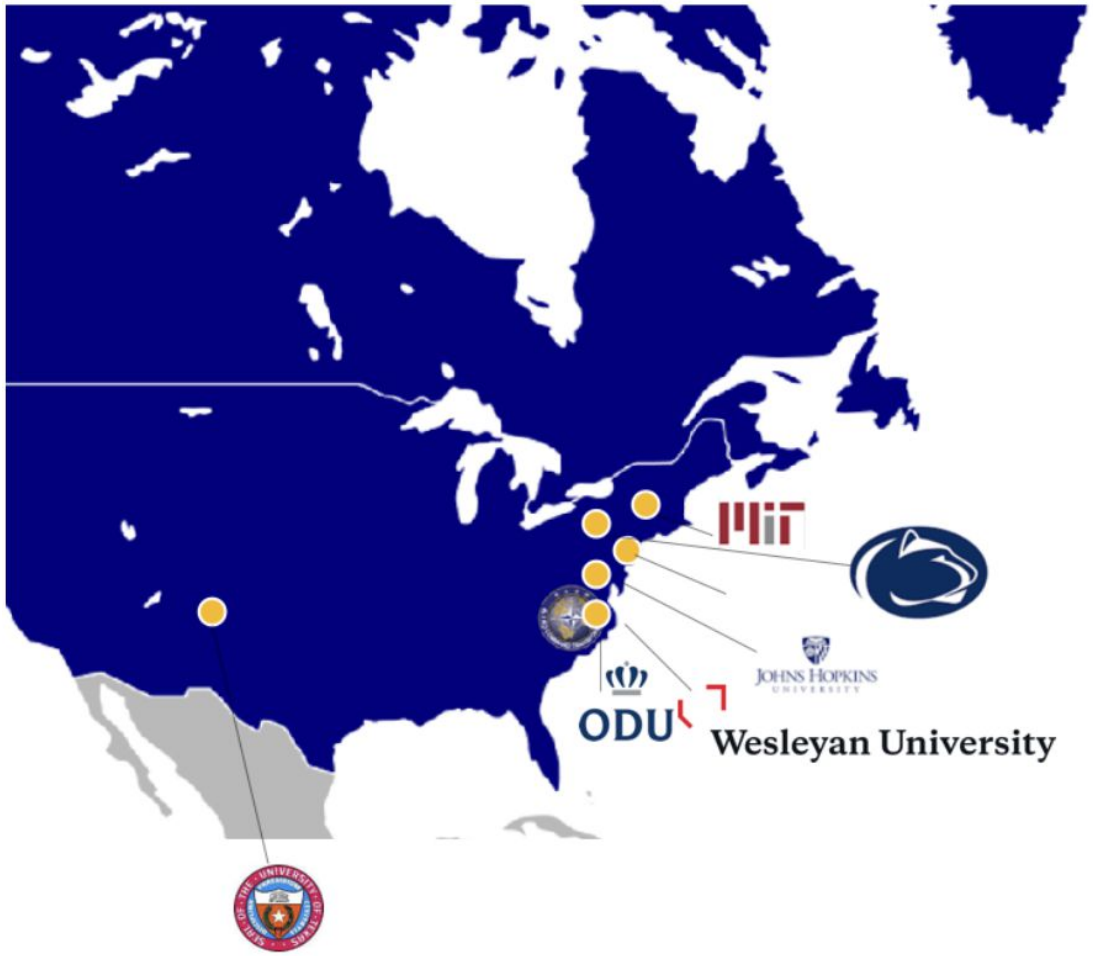
Open Innovation for NATO and NATIONS

UNDERSTAND environment and issues
DESIGN concepts and solutions
DEVELOP prototypes

GENERATE and IMPLEMENT ideas

CREATE and ANIMATE a NATO-wide Innovation Network

The Academia Network



ACT - Improving today,
Shaping tomorrow,
Bridging the two