



**GSC** | 22  
MONTREUX, SWITZERLAND



# IEEE Initiatives in Autonomous & Intelligent Systems

## IEEE Standards Association

Montreaux, Switzerland – March 26, 2019



# Summary of Key IEEE Initiatives

- The IEEE Global Initiative on Ethics of Autonomous & Intelligent Systems
  - Ethically Aligned Design, 1<sup>st</sup> Edition
- IEEE P7000 Series of Standards
- The Ethics Certification Program for Autonomous & Intelligent Systems (ECPAIS)
- Engagement in Related A/IS Initiatives
  - Council on Extended Intelligence (CXI)
  - Ethically Aligned Design University Consortium (EADUC)



## IEEE STANDARDS ASSOCIATION

# The IEEE Global Initiative on Ethics of Autonomous and Intelligent Systems

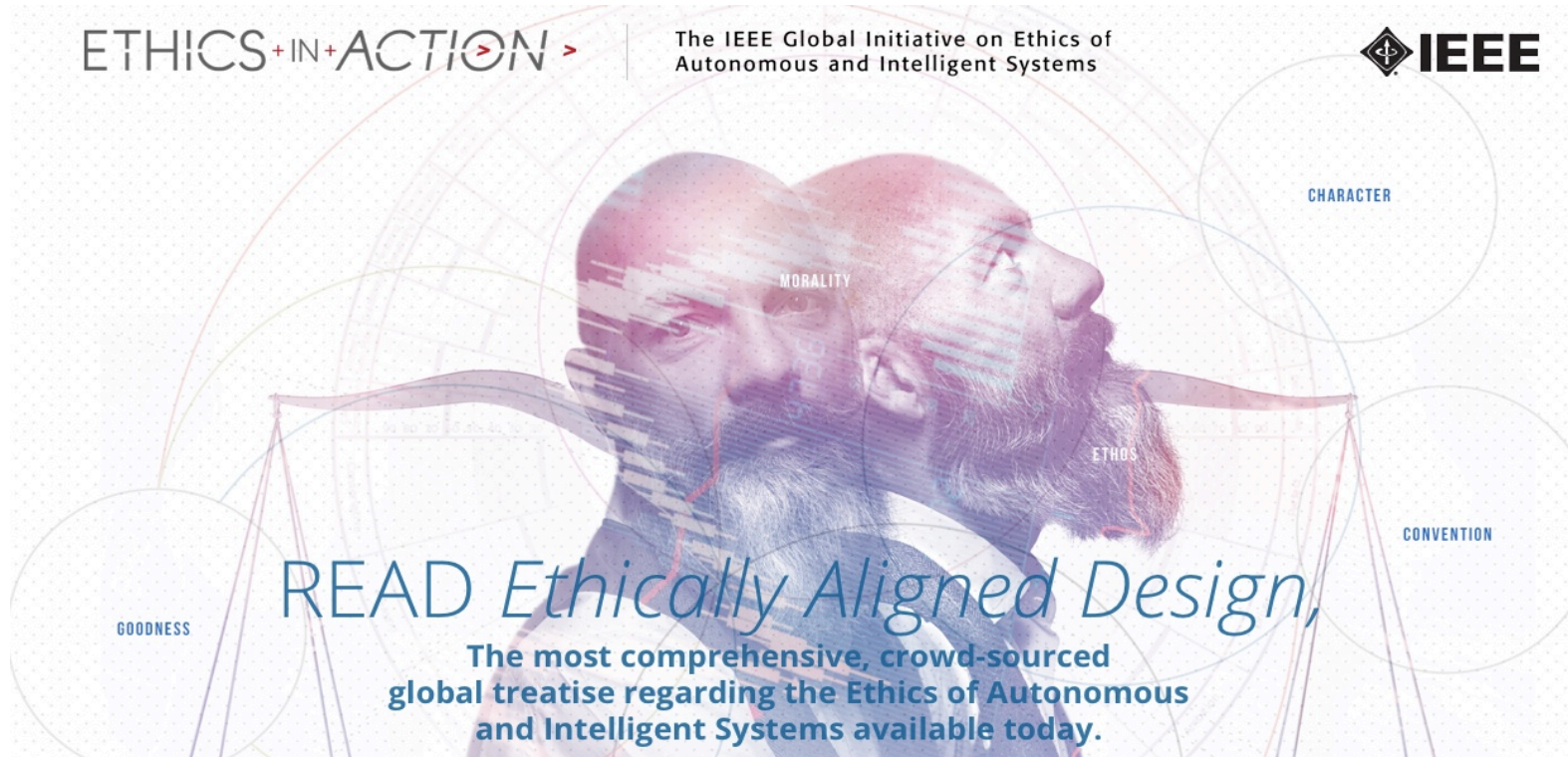
An incubation space for new standards and solutions, certifications and codes of conduct, and consensus building for ethical implementation of intelligent technologies

The IEEE Global Initiative on Ethics of Autonomous and Intelligent Systems (The IEEE Global Initiative) is a program of the IEEE Standards Association



ETHICS + IN + ACTION >

The IEEE Global Initiative on Ethics of  
Autonomous and Intelligent Systems



**Main Website**

<https://standards.ieee.org/industry-connections/ec/autonomous-systems.html>

**Ethics in Action**

<https://ethicsinaction.ieee.org>



## Our Mission

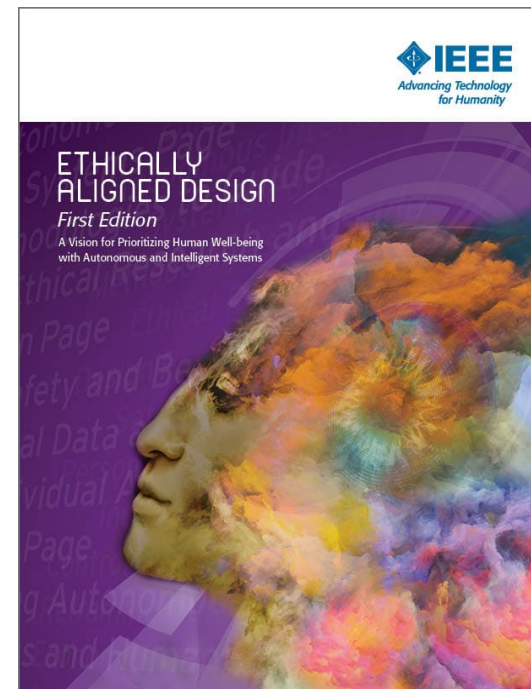
To ensure every stakeholder involved in the design and development of autonomous and intelligent systems is educated, trained, and empowered to prioritize ethical considerations so that these technologies are advanced for the benefit of humanity.



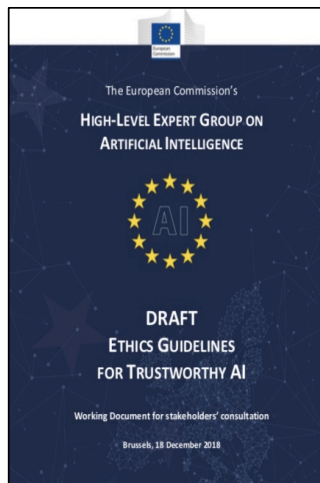
# *Ethically Aligned Design, First Edition*

A key component of our work with The IEEE Global Initiative is the creation of our work, ***Ethically Aligned Design***.

*Ethically Aligned Design, First Edition* (EAD1e) launching April 10, 2019 represents the culmination of a three-year process guided from the bottom up since 2015 by the rigor and standards of the engineering profession and by a globally open and iterative methodology involving hundreds of global experts.

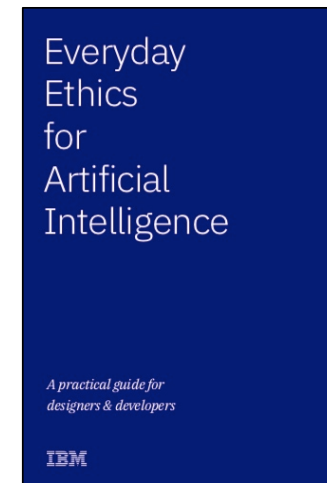


# Ethically Aligned Design, First Edition



In its earlier manifestations, *Ethically Aligned Design* informed collaborations on AI Governance with a broad range of governmental and civil society organizations, including the United Nations, the European Commission, the Organization for Economic Cooperation and Development and many national and municipal governments and institutions.

Moreover, the engagement in all of these arenas and with such partners has put the collective knowledge and creativity of The IEEE Global Initiative in the service of global policy making with tangible and visible results. Beyond inspiring the policy arena, EAD and this growing body of work has also influenced the development of industry related resources such as IBM's *Everyday Ethics for Artificial Intelligence*.





# IEEE P7000™ Standardization Projects

The IEEE P7000™ series of standards projects under development represents a unique addition to the collection of over 1,900 global IEEE standards and projects. Whereas more traditional standards have a focus on technology interoperability, functionality, safety, and trade facilitation, the IEEE P7000 series addresses specific issues at the intersection of technological and ethical considerations. Like its technical standards counterparts, the IEEE P7000 series empowers innovation across borders and enables societal benefit.

For more information: <https://ethicsinaction.ieee.org/#set-the-standard>

## Set the Global Standards

Join an IEEE P7000™ Working Group  
and Set the Global Standards for the future of Ethical A/IS.



# IEEE P7000™ Standardization Projects

**IEEE P7000™** - Model Process for Addressing Ethical Concerns During System Design

**IEEE P7001™** - Transparency of Autonomous Systems

**IEEE P7002™** - Data Privacy Process

**IEEE P7003™** - Algorithmic Bias Considerations

**IEEE P7004™** - Standard on Child and Student Data Governance

**IEEE P7005™** - Standard on Employer Data Governance

**IEEE P7006™** - Standard on Personal Data AI Agent Working Group

**IEEE P7007™** - Ontological Standard for Ethically driven Robotics and Automation Systems

**IEEE P7008™** - Standard for Ethically Driven Nudging for Robotic, Intelligent and Autonomous Systems

**IEEE P7009™** - Standard for Fail-Safe Design of Autonomous and Semi-Autonomous Systems

**IEEE P7010™** - Wellbeing Metrics Standard for Ethical Artificial Intelligence and Autonomous Systems

**IEEE P7011™** - Standard for the Process of Identifying and Rating the Trustworthiness of News Sources

**IEEE P7012™** - Standard for Machine Readable Personal Privacy Terms

**IEEE P7013™** - Inclusion and Application Standards for Automated Facial Analysis Technology.



# The Ethics Certification Program for Autonomous and Intelligent Systems

**IEEE STANDARDS ASSOCIATION** Search

Standards Products & Services Technologies & Initiatives Participate MAC ADDRESS

[Twitter](#)  
[LinkedIn](#)  
[Facebook](#)  
[Email](#)  
[Share](#)

## The Ethics Certification Program for Autonomous and Intelligent Systems (ECPAIS)

Developing metrics and processes towards the implementation of a certification methodology addressing transparency, accountability and algorithmic bias

[< Industry Connections](#)

The Ethics Certification Program for Autonomous and Intelligent Systems



**About**

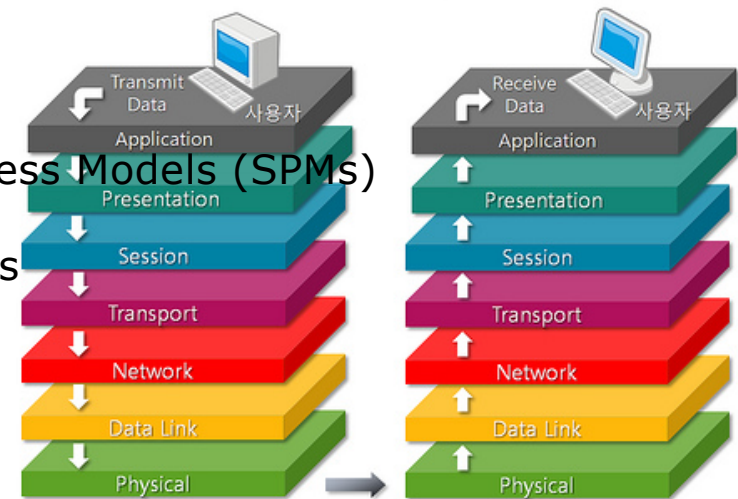
The goal of The Ethics Certification Program for Autonomous and Intelligent Systems (ECPAIS) is to create specifications for certification and marking processes that advance transparency, accountability and reduction in algorithmic bias in Autonomous and Intelligent Systems (AVIS).



# The Ethics Certification Program for Autonomous and Intelligent Systems

## Core Process/Reference Model

- Starting with a Generic Ethics Process Model (GPM)
- The ECPAIS contexts are derivatives as Specific Process Models (SPMs)
- GPM Facilitates scaling and extension of ECPAIS focus
- Provides transparency & effective communications
- Provides Pathways for emerging IEEE Standards



## The Council on Extended Intelligence (CXI)

The Council on Extended Intelligence (CXI) was directly inspired by the work of The IEEE Global Initiative and the work of MIT Media Lab around “Extended Intelligence”. CXI was launched jointly by the IEEE Standards Association and The MIT Media Lab.

CXI’s mission is to proliferate the ideals of responsible participant design, data agency, and metrics of economic prosperity, prioritizing people and the planet over profit and productivity.

Membership includes thought leaders from the EU Parliament and Commission, the UK House of Lords, the OECD, the United Nations, local and national administrations, and renowned experts in economics, data science, and multiple other disciplines from around the world.

For more information:

[globalcxi.org](http://globalcxi.org)



## Ethically Aligned Design University Consortium (EADUC)

### ***Background:***

Global engineering education today is largely focused on scientific and technological courses that are not intrinsically related to the analysis of human values overtly designed to positively increase human and environmental wellbeing.

The Consortium will focus on developing and promoting the issues, recommendations, and themes outlined in *Ethically Aligned Design* along with the A/IS Ethics oriented curriculum already being taught by Member Universities. The initial course, and eventual global curriculum, will be designed so it can be integrated into any program educating future engineers.

- Currently in development
- Will feature 15-20 Global Partner Universities
- Program to be launched in Summer, 2019
- Program to utilize *Ethically Aligned Design, First Edition*



# Thank you

For more information, please contact:  
Rudi Schubert  
[r.schubert@ieee.org](mailto:r.schubert@ieee.org)

IEEE Standards Association:  
[www.ieee.org](http://www.ieee.org)