



Centre *for*
Assuring
Autonomy

BIG Argument

**A whole system
approach to safety
assurance for AI**

What is the BIG Argument?

Our BIG Argument is a new way to address the safety case challenges around AI and AI-enabled autonomous systems (AS). As an acronym, BIG represents:

- Balanced; addressing safety alongside other ethical issues.
- Integrated; bringing together the social, ethical and technical aspects of safety assurance.
- Grounded; building on long-established safety practices from safety-critical industries.

The BIG Argument is a cross-domain, comprehensive approach which brings together the entire safety case argument and takes into account the development and deployment of 'frontier' AI.

Who is the BIG Argument for?

Our BIG Argument has a diverse and broad audience including:

Safety Specialists and Regulators

For example, those who have the responsibility for signing off safety cases.

AI Developers and Engineers

For example, those who cover the full engineering lifecycle.

Non-technical Professionals

For example, managers, lawyers, ethicists, policy makers and social scientists.

Users

For example, trained professionals from clinicians to pilots, to the general public.

Why use the BIG Argument?

Our BIG Argument addresses AI safety at both the technical and the sociotechnical levels across AI, AS, and robotics. Importantly, it enables and supports the safe deployment of 'frontier' AI systems, such as Large Language Models (LLMs), addressing a critical gap in development and deployment.

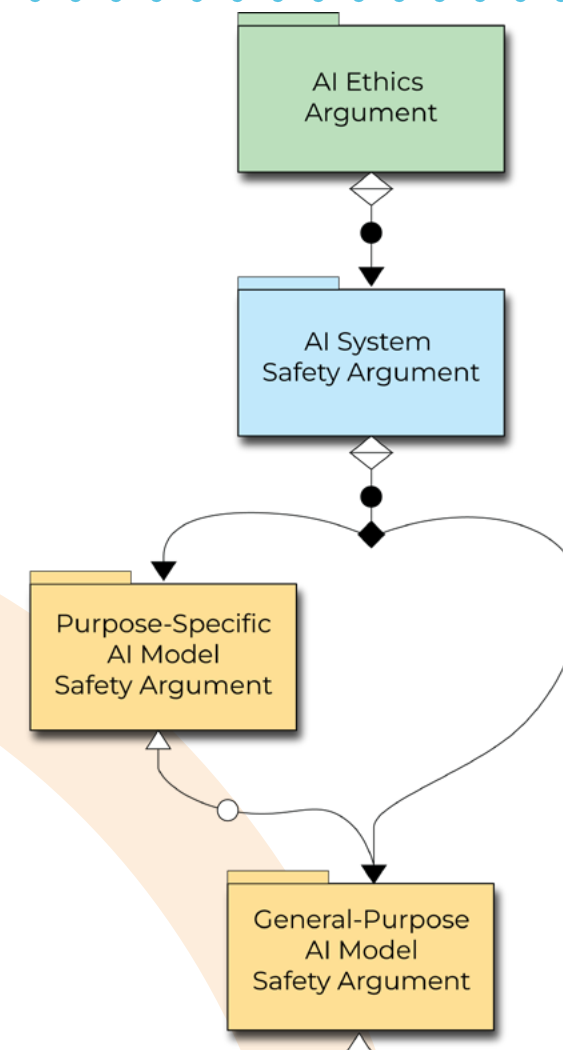
The use of safety cases to assure such technologies is becoming increasingly relied on by developers and regulators to address the emerging challenges these technologies present. BIG introduces a way to address these challenges in a sustainable, scalable and practical way.

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The BIG Argument for AI Safety Cases provides a timely framework for considering the diverse and interconnected range of safety and ethical issues associated with the development and deployment of AI systems. Moreover, by providing a framework that supports consideration of risks associated with technical capability, alongside those associated with particular societal and systems contexts, the BIG Argument provides a foundation for researchers and practitioners to further develop assurance approaches that holistically consider the range of risks associated with the use and mis-use of AI systems - including environmental risks. ”

Eliot Gillings, Policy Advisor, Digital and Physical Infrastructure, Royal Academy of Engineering

How does the BIG Argument work?



The BIG argument is architectural, offering a compositional view of an entire AI safety case. It demonstrates how more detailed arguments, covering trade-offs (based on PRAISE), risk analysis (SACE) and AI model training (AMLAS), coherently and traceably integrate. Where a system includes 'frontier' AI, such as LLMs, BIG incorporates a dedicated argument module to address the potential hazardous behaviours posed by general-purpose AI capabilities.

Implementing the BIG argument entails both the full or partial application of PRAISE, SACE and AMLAS, as well as extending these approaches to address the unique capabilities of 'frontier' AI models.

The expertise behind the BIG Argument

BIG has been developed by the Centre for Assuring Autonomy, a £10m partnership between Lloyd's Register Foundation and the University of York. Our team of globally recognised experts has been advancing the safety of complex systems through pioneering research for over 30 years.

The BIG Argument brings together our industry-recognised frameworks and methodologies and demonstrates that prioritising safety can go hand in hand with innovation:

- Principles-based Ethics Assurance (PRAISE)
- Assurance of Autonomous Systems in Complex Environments (SACE)
- Assurance of Machine Learning for use in Autonomous Systems (AMLAS)



Work with us

There are several ways the Centre for Assuring Autonomy can support your organisation in developing safety assurance cases.

Training

Our bespoke training and education sessions enable industry, regulators, and policy makers to develop the expertise necessary to ensure that autonomous systems are brought safely to market and into operation.

Research

We can help you solve emerging and critical research questions around safe AI through our multidisciplinary team approach.

Partnerships and collaborations

Our team of experts works with organisations to help develop safety cases, address particular challenges, or develop compliance procedures.

Consultancy

Our bespoke consultancy service enables you to build a package of support which meets organisational needs and access the right experts for your AI and AS challenges.

Our safety assurance guidance and frameworks

The Big Argument is part of a suite of freely-available frameworks and guidance which organisations can use to develop safety cases for autonomous systems and AI, including frontier AI.

Read our other factsheets in this series:

- PRAISE
- SACE
- AMLAS



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