The Advent of AI and National Power

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A new instrument of mind

Every civilization has been shaped by the instruments through which it extends the reach of the human mind: the alphabet, the codex, the printing press, the telegraph, the computer. Artificial intelligence belongs to this lineage, yet it differs in one decisive respect. The earlier instruments stored, copied and transmitted thought; AI begins to *perform* it. At its core, AI is the craft of building systems that learn patterns from experience and act on them — recognising, predicting, reasoning, composing and, increasingly, planning and executing tasks with a measure of autonomy. Aristotle imagined looms that might weave by themselves; we now have machines that draft, diagnose and deliberate.

Where AI is already at work, and where it is heading

- **Social welfare and healthcare.** Today: earlier detection of disease from medical images, triage and clinical documentation, faster drug discovery, and fraud detection in benefit systems. Tomorrow: personalised prevention for ageing populations, continuous remote monitoring, and welfare services that anticipate need rather than await application.
- **Security.** Today: cyber-defence that detects intrusions at machine speed, protection of critical infrastructure, border and maritime surveillance, and disaster forecasting. Tomorrow: autonomous defensive systems locked in a contest with AI-enabled attackers, making resilience a matter of continuous adaptation.
- **Defense.** Today: logistics and predictive maintenance, sensor fusion, decision support, and uncrewed aerial and naval systems, as recent conflicts have shown. Tomorrow: human-machine teaming, swarms, and compressed

decision cycles, raising urgent questions of meaningful human control and escalation.

- **National intelligence.** Today: triage of vast open-source, signals and imagery streams, translation, and pattern detection across data no analyst could read. Tomorrow: AI-assisted all-source fusion and anticipatory warning, with the analyst's judgement more precious, not less.
- **Strategic diplomatic communications.** Today: real-time monitoring of the information space, detection of coordinated disinformation and deepfakes, and multilingual public diplomacy. Tomorrow: a contest of narratives waged at machine scale, where credibility, transparency and trust become a nation's most defensible assets.

Our debt to the pioneers

None of this arrived suddenly. It rests on the labour of a small circle of pioneers, the new renaissance intellectuals with a deep understanding of wider spectrum of the sciences, who pursued an unfashionable idea across decades of doubt. Then came the long "AI winters" of the 1970s and late 1980s, when promises outran results, funding dried up and neural networks were all but dismissed. A few researchers persisted, refining machine learning algorithms that would only prove their worth once data and computing power caught up. Our debt to them is therefore not only intellectual but moral. They bequeathed us a powerful instrument together with the duty to use it wisely. For nations, the lesson is clear: power in the age of AI will belong less to those who merely buy its fruits than to those who cultivate the soil in which ideas grow - education, open inquiry, long-term research and the freedom to pursue what others think futile.

Angelos T Kolokouris: a farsighted AI pioneer

Among the pioneers in the field of applied R&D on AI, is one of our own, Angelos T Kolokouris, a renaissance man since his high-school years in the humble environment of Vlahiotis, a small village near Sparta, where he grew up in Greece. Encouraged by the conducive settings of his serene village and the encouraging tradition of his Spartan heritage, young Angelos got absorbed in a wide range of subjects. Among them, he favored by far the study of Mathematics and Ancient Greek, which he planned to pursue at a Greek university. Things, however, evolved quite differently as the ascent to power of the Greek junta forced Angelos, speaking no word of English, to escape Greece and settle down in New York City, thanks to the understanding and support by the US Consular Services. He has remained a grateful US citizen ever since then and contributed to the extent possible to the advancement of US science and technology.

Throughout his career, he followed the advice of one of his mentors, the Nobelist and polymath Herbert Simon, who viewed AI as an empirical science. In that sense, besides a multi-disciplinary theoretical background, practice and observation with measurement are the keys of the field. Angelos remained a faithful practitioner of the field and pursued a practice that included applied AI and AI systems building. In the 1980s and thereafter, his companies played a pioneering role in theoretical & applied AI, developing PROLOG interpreters & systems tools and implementing major AI systems in critical civic and defense areas. He is currently involved in undertakings on AI policy and R&D mostly to (a) counter disinformation and (b) implement predictive AI systems.

Major AI Projects in the USA

The R&D teams headed by AT Kolokouris successfully completed many demanding AI applications, most of them having to do with critical requirements. Below is a small but indicative sample of the nature of work they have undertaken:

1. Cooperation with scientists at **NASA's Goddard Space Flight Center** for the development of an interface between ESI's PROLOG and software systems managing the Shuttle Robotic Arm. Development of the interface between PROLOG and various robot control modules.
2. Research and development of the **Expert Antenna System (XAS**), an high-accuracy expert system for automatic recognition of data and the control of radar antennas.
3. Analysis, planning and management of the technical team for the development of **The Expert Communicator**, an artificial intelligence system aiming to support multimedia communications for enterprise networks. Developed in the form of a multi-modal AI system, it acts as an office organiser aiming to support all types of business communications. For one, it sifts through incoming documents and assists the generation of proper responses by utilising several advanced technologies (primarily, natural language understanding and text generation).
4. **Artificial Intelligence Enhanced Battlefield Management Communications** – An advanced R&D project for the **Central Command Laboratory - U.S. Army.** In order to support battlefield communications, command and control messages and other communicative exchanges that must be handled by taking into account spatial parameters fused with the constraints of the hostile electromagnetic environment and the procedures of strategic operations.
5. Research, Design and Development of an expert assistant system to be used by the **National Oceanic and Atmospheric Administration (NOAA)** under the title: **"Cartographic Data and Information Management for an Intelligent Workstation".**

The education of a renaissance man

Despite the initial difficulties, Angelos Kolokouris obtained a BSc in mathematical physics from CUNY USA, followed by graduate studies in nuclear engineering, an interdisciplinary Master's in quantum mechanics at Penn State, and doctoral studies in Philosophy (Mathematical Logic) and Computer Science at Temple University, focusing on the Logical Foundations of AI.

During his interdisciplinary studies on Quantum Mechanics he was fortunate to study (a) Mathematical Logic under the guidance of John Dawson, a specialist on Gödel's theorems and editor of his collected works, (b) quantum mechanics and mathematical physics under the theoretical physicist Gordon Fleming, and (c) functional analysis at the acclaimed Penn State Mathematics Department. Following Richard Feynman's enthusiastic suggestion, he used as his main textbook John von Neuman's "Mathematical Foundations of Quantum Mechanics." At the end of the quantum mechanics program, he had attained a deep grasp of Gödel's incompleteness theorems and their far-reaching relevance, of von Neumann's mathematical works, and the theory, the logical foundations and the interpretation of quantum mechanics.

The RIEAS intelligence team, pursuant to an in-depth analysis of Kolokouris' AI accomplishments and foresight, has come to the conclusion that, depending on the decade, he was 10-30 years ahead of the research & knowledge level existing in Greece during the past four decades. When he first visited Greece as an AI entrepreneur, back around 1985, invited by the newly established General Secretariat for Science and Technology, he gave a series of high profile lectures at their offices and in several prominent Greek universities. His message was clear and well-illustrated with a practical implementation path, which was enthusiastically approved by the then prime minister: **AI is the Future**. The same motivating call was repeated many times thereafter through the ensuing decades. No matter; the establishment did not want to hear any of this type of encouragement. In fact, it became upset and threatening. The paradoxical part of our story, which is indicative of the sad state of AI affairs in Greece, relates to the stubborn insistence of the Greek establishment to ignore practitioners of AI, recognized for their accomplishments in Applied AI, especially if they originate from the US, like Angelos T Kolokouris. Instead, they prefer to import the required systems. That is a chronicle of national failure.

RIEAS Announces a New Series on "AI and National Power"

At this point, on behalf of RIEAS, I am elated to announce the establishment of a series on 'AI and National Power' that will be edited by Angelos T Kolokouris, who will also act as commentator and occasional contributor. - John M Nomikos