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# EXPERTSAKE

# Military-civil fusion is a key Chinese strategy with long-term implications

Jingdong Yuan (SIPRI) and Yifei Zhu (ISDP)

#### Introduction

By Maud Descamps

The People's Liberation Army (PLA) of China is undergoing a significant strategic transformation, prioritizing modernization through the integration of advanced technologies into its military capabilities. In recent years, the PLA has adopted increasingly assertive and coercive actions in the Indo-Pacific region while accelerating the development of new military capabilities and operational concepts. These efforts aim to enhance China's ability to "fight and win wars" against a "strong enemy," deter third-party intervention in conflicts along its periphery, and project power on a global scale.

Concurrently, China has largely curtailed, postponed, or ignored recurring bilateral defense engagements with the United States, primarily due to Washington's support for Taiwan. This shift in China's defense posture must be understood within the broader context of its territorial disputes in the Indo-Pacific, its strategic partnership with Russia, and its ambitions to reshape the international order in line with its governance model. As the Chinese Communist Party (CCP) seeks to achieve its vision of "national rejuvenation" by 2049, CCP leadership views the establishment of a modern, capable, and "world-class" military as essential to navigating an increasingly volatile global landscape.

A key pillar of China's long-term strategy is the development of a fully self-sufficient defenseindustrial complex, closely integrated with a robust civilian technology sector, to ensure that the PLA remains equipped with cutting-edge military capabilities.

The defense discourse related to China is a sensitive matter that is often tackled through a U.S. perspective. For this reason, the Institute for Security and Development Policy (ISDP) interviewed, early this year, two Sweden-based experts, Dr. Jingdong Yuan from the Stockholm International Peace Research Institute (SIPRI) and Dr. Yifei Zhu from ISDP's China Center, who participated in the

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ISDP and EuroHub4Sino (EH4S) workshop titled "Navigating the Dragon's Tech Leap: European Responses to the PLA's Technological Transformation" in September 2024 with a eurocentric perspective.

In the first interview, Dr. Jingdong Yuan, Director of the China and Asia Security Program at SIPRI, discusses the People's Liberation Army's (PLA) technological transformation, focusing on advancements in artificial intelligence (AI), space systems, hypersonic capabilities, and military-civil fusion. He highlights the implications of these developments for European security, emphasizing the need for Europe to enhance its defense capabilities and technological preparedness.

The second interview, with Dr. Yifei Zhu, a Research Fellow at ISDP, examines the European response and future strategic outlook. He explores the integration of foreign and domestic technologies within the Chinese military, particularly in key areas such as drones and semiconductors, and the implications for hybrid warfare. Additionally, he addresses Europe's vulnerabilities, particularly in cybersecurity and dual-use technologies, and discusses strategies for balancing technological openness with risk mitigation.

Both experts respond to the same set of questions, offering their unique insights on these critical issues.

We would also like to extend our gratitude to the previous interns, Céline Hedin and Tony Su, who conducted these interviews, and whose efforts were instrumental in shaping this research.

#### Jingdong Yuan (SIPRI)

Dr. Jingdong Yuan is the Director of the China and Asia Security Program at Stockholm International Peace Research Institute. Dr. Yuan's research focuses on Indo–Pacific security, Chinese foreign policy, Sino–Indian relations, China-EU relations, and nuclear arms control and nonproliferation. He is the co-author of *Chinese Cruise Missiles: A Quiet Force-Multiplier* (2014) and *China and India: Cooperation or Conflict?* (2003), and co-editor of *Re-engaging China: Can Australia Lead the Way Again* (2023), *Trump's America and International Relations in the Indo-Pacific* (2021) and *Australia and China at 40* (2012). His publications have appeared in *Asian Survey, Australian Journal of International Affairs, Contemporary Security Policy, International Affairs, International Journal, Journal of Contemporary China, Journal of International Affairs, Nonproliferation Review, Washington Quarterly, and in many edited volumes.* 



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#### Yifei Zhu (ISDP)

Yifei Zhu is a Research Fellow at the Institute for Security and Development Policy's Stockholm China Center and an affiliated researcher at the Institute of East Asian Studies (IN-EAST) at the Universität Duisburg-Essen in Germany. He earned his Ph.D. in Political Science from the Freie Universität Berlin with a dissertation on the political economy of the cross-Taiwan Strait relations, for which he conducted a year of fieldwork in Taiwan. Additionally, he holds an M.A. in International Politics and American Studies from the Johns Hopkins University-Nanjing University Center for Chinese and American Studies. His research interests encompass economic-security dynamics in international relations, state-business relations in economic governance, technology and industrial policy, regionalism, and institutional analysis. His research focuses on China and East Asia and their political-economic relations with the EU and the U.S.



The questions are divided in three different categories. Question 1 refers to the PLA and military modernization. During the EH4S workshop, discussions centered on the People's Liberation Army's (PLA) ongoing technological transformation. Significant advancements are reshaping the military landscape, particularly in emerging technologies such as artificial intelligence (AI), space systems, and hypersonic weapons. Additionally, the increasing integration of civilian and military technologies, often referred to as military-civil fusion, is further accelerating these developments.

Questions 2 and 3 focus on impact/ vulnerabilities and response strategies. These transformations raise critical questions regarding their impact on European security. The expansion of technological capabilities has introduced new vulnerabilities, particularly in cybersecurity and psychological warfare, alongside challenges in traditional defense domains. Understanding how Europe can assess and mitigate these risks is crucial to developing effective response strategies.

The last questions (4-5) are related to transatlantic cooperation and future trajectories. As Europe navigates its security landscape, collaboration with allies, particularly the United States, will be essential in shaping future trajectories and strengthening resilience against evolving threats.

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#### Question 1 : What aspects of PLA's technological transformation would you highlight to give your view on important changes and potential impact?

Yuan: Clearly, the military-civil fusion that has been introduced for nearly a decade now has yielded important results, perhaps less in the immediate delivery of advanced weapons systems but more about the integrated nature of both commercial and military technologies from R&D to prototype to production at scales, where both spin-off and spinon effects will become even more obvious as the process becomes further developed and streamlined. Where recent technological transformation is concerned, the introduction of advanced 5th fighter aircraft-reportedly with indigenously produced engines (a key bottleneck in the past) and display of 6th generation, both enhanced surface and undersea capabilities with the commissioning of new naval ships and submarines are changing the landscape in the Western Pacific. Developments of military AI are also of significance given its growing importance and utility in all dimensional warfare, from processing data to precision in target hits. Meanwhile, application in quantum encryption and detection in communication-China has conducted successful tests in recent years but is not sure if the military application is already underway—also has the potential of transforming the PLA in important ways. While not an imminent threat to Europe, these aspects are drawing growing attention for the U.S. as it seeks to both compete and constrain to maintain its leading positions.

**Zhu**: PLA's efforts to integrate foreign acquisitions with domestic Military-Civil Fusion (MCF) deserve particular attention. A two-stage approach underpins this strategy: civilian bodies acquire foreign civilian technologies and then they work with the military bodies to transform and incorporate them for military purposes. Notable areas of focus include drones, semiconductors, and advanced computers. This model not only circumvents Western restrictions on military technology access and accelerates innovation, but also strengthens the PLA's capabilities in leveraging cutting-edge technologies for new forms of warfare and weaponry.

This technological transformation has profound implications for geopolitics and military readiness. The Russia-Ukraine War has demonstrated the effectiveness of drones in modern warfare, showing how these technologies can fundamentally reshape battlefield dynamics. Additionally, the emergence of internet-based influence operations and cyber campaigns—as seen in alleged PRC actions against Taiwan, the U.S., and Europe—indicates a significant shift toward non-traditional warfare. These developments showcase the PLA's growing capabilities and its potential advantage in hybrid warfare scenarios.

Question 2 : Given the PLA's rapid technological advances, what areas do you see as the most critical vulnerabilities for Europe? How can European countries mitigate these risks without compromising technological openness and collaboration?

**Yuan :** Several areas will be of particular concern to Europe. These include AI, cyber, and space developments where China has made significant progress in recent years. As current and future military capabilities are highly dependent on and enhanced by technological superiority, maintaining the edge in these areas will be critical for Europe to minimize, mitigate and manage vulnerabilities. Europe obviously needs to strengthen its capacities in these areas, and engage in strategic foresight analysis to better understand and get prepared for various possible futures where direct or indirect military engagement with the PLA in both theaters

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could be possible, and therefore better analysis is required. This will inform Europe where the PLA's current strengths are, where Europe is particularly vulnerable, and where the Chinese military is still facing technological obstacles, and hence where Europe should be careful in S&T collaboration and where, through enhanced investment screening and export controls on technology transfers, in addition to Europe's own efforts and investment in these areas, will be critical in the coming years.

Zhu: Regarding China's potential operations against Europe, its cyber domain advancements represent the greatest risk. China's position as a leader in cyber-related technologies-coupled with its rapidly expanding capabilities—puts Europe at a strategic disadvantage, as the continent lacks both leverage and competitive edge in this sphere. While physical armed conflicts are unlikely, Europe faces a higher probability of engaging in "wars without smoke" with China. Indeed, cyber confrontations between the two sides are becoming more frequent. Preventing the outflow of dual-use technologies poses another grave challenge in technology control. The line between civilian and military applications is becoming increasingly blurred. Modern warfare now encompasses a broad spectrum of capabilities, making it even more difficult to distinguish between technologies intended for civilian use and those with military potential.

Europe faces significant challenges in updating regulations that balance technological openness with preventing unwanted transfers. This struggle is evident in the dilemma faced by the Biden administration's "small yard, high fence" strategy, which is struggling to effectively restrict sensitive technology while maintaining healthy trade relationships. Further complicating matters is the need for coordination within the EU and with external allies, especially the U.S. The divergent interests and unaligned actions among member states and partners create vulnerabilities beyond just China-related issues.

Mitigating risks without compromising openness is thus extraordinarily difficult. The dual-use nature of emerging technologies and the inherent challenges of aligning diverse interests within the EU and with allies make a comprehensive solution elusive. Enhanced coordination, strategic prioritization, and dynamic regulatory frameworks are essential but difficult to implement effectively.

#### Question 3 : Regarding upholding a unified European security front and response strategies, where lies its strengths and weaknesses?

Yuan: Europe certainly has come a long way in more fully grasping the changing geostrategic environments and growing threats to its security and its way of life, including such normative considerations as human rights, good governance, and social wellbeing, in the aftermath of Russia's invasion of Ukraine. As the war has dragged on its third year, and with mounting concerns about Europe's own (lack) of capacities in both meeting the defense requirements of Ukraine and strengthening its own defense capabilities-these are not just about defense spending to above 2 percent of GDP, but the general state of its defense industrial base to supply adequate amounts and qualitatively superior defense equipment, recruitment and training, and overall preparedness for potential future expansion of military conflicts beyond Ukraine and, more seriously, the use of nuclear weapons. This recognition and actions taken by many members of Europe, be they NATO or EU members, and closer transatlantic coordination, is a clear sign of strengths. However, the gap and hence weakness remains, where near-term capacity falls short of the level of preparedness in both deterrence and defense remains inadequate. It should also be noted

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that Europe (and NATO) is now well aware of the importance of focusing on technological advantage and is making the efforts to maintain the lead, close the gap, and catch up, from AI, quantum, hypersonic systems, to biotechnologies, space, and communication networks, and their military applications.

**Zhu**: Europe's strengths in maintaining a unified security front lie in its technological edge, robust institutional frameworks, and strategic partnerships. European nations possess significant technological advantages across diverse sectors, enhancing their ability to address modern security challenges. Institutions like the EU and NATO provide established mechanisms for coordinated foreign and defense policies, fostering collective action. Moreover, heightened security awareness following the Russia-Ukraine War has galvanized European countries to invest more in defense and preparedness. Europe also benefits from technological partnerships with non-allied partners, with the potential for creating a broader network of coordination and collaboration. However, Europe faces significant weaknesses stemming from both internal and external factors. The complex economic and security interdependence with China makes policy alignment difficult. As mentioned in the previous answer, member-states' divergent interests and perspectives frequently impede unified decision-making. Both EU and national bureaucracies slow the development and execution of coordinated strategies. Moreover, tensions in the transatlantic alliance-particularly during Trump's second term-threaten to weaken Europe's crucial security partnership with the U.S.

Question 4 : Should Europe align with transatlantic partners to counteract the PLA's technological growth and potential threats? How would the new U.S. administration shape the alliance and its capacity to face rising powers such as China? Are there specific policy frameworks or joint projects that could enhance Europe's strategic position?

Yuan: Trump's return to office adds complexity and a degree of uncertainty in the transatlantic relationship. It is important to maintain and strengthen the existing frameworks such as TTC and the NATO structure to coordinate economic, technology, and defense policies vis-à-vis China in the coming months in particular as the new U.S. administration fills key positions in government. Contacts at the functional level are expected to remain strong and working-level consultation and cooperation will likely continue relatively undisrupted. Sharing intelligence and information remains critical in transatlantic collaboration, particularly in the areas of technological advancement and military applications in the PLA and the challenges China's defense industrial base continues to face. At the same time, Europe should explore its own potentials to the fullest extent, and revive and redesign defense technological and weapons systems, and see what can and should be done in the current environment. Europe should play to its strengths and realize its potential. There is also the great potential of working with like-minded countries in Asia, such as Japan and South Korea, to jointly develop defense technologies and military equipment. Some projects are already underway but this can be further expanded.

**Zhu**: Europe has little choice but to align with the U.S. in addressing the PLA's technological rise. However, while the U.S. remains Europe's key security partner, its interests often diverge from Europe's, particularly in areas of trade and economic policy. Under a second Trump administration, tensions could escalate, with Trump's threats of a trade war potentially forcing Europe to seek deeper

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economic ties with China. Trump's approach would also cast doubt on U.S. commitments to NATO and its leadership role within the alliance. This raises questions about how far Europe can or should go to meet Washington's demands, especially if it involves military spending or reshaping alliances.

*Question 5* : The workshop emphasized the importance of proactive European responses to China's military rise. In your opinion, what policy shifts or institutional changes are necessary within the EU or NATO to effectively manage the PLA's growing influence in the coming decade?

**Yuan :** At the moment, given the ongoing war in Ukraine, a more proactive response to China can start at home, by increasing its support to Ukraine and therefore free up U.S. resources so Washington can concentrate on the Indo-Pacific, from the Korean Peninsula to the Taiwan Strait. Second, Europe should further explore collaboration with Indo-Pacific partners to leverage combined potentials in technologies, innovations, and weapons development. Third, Europe will do well in better understanding the technological transformation of the PLA, its current capabilities, plans, and likely future projections so that Europe can be better prepared both in terms of its own responses and more importantly, better transatlantic coordination to enhance the multiplier impacts and reduce redundancy, duplication, and lack of coordination. There should be a strengthened structure centered on the high representative in foreign policy, EEAS, and counterparts in membercountries. Lastly, even though the PLA presents significant challenges, efforts should still be made to engage the Chinese military in promoting understanding of each other's perspectives and concerns, and in developing risk reduction and crisis management mechanisms to prevent, mitigate, and respond to potential future incidents and conflicts.

**Zhu**: While I cannot provide a comprehensive answer as this falls outside my area of expertise, I believe an effective response would require three essential components: stronger coordination among EU member-states, well-defined shared strategic priorities, and flexible regulatory frameworks with robust review mechanisms.

#### Afterword

By Maud Descamps

The insights from Jingdong Yuan (SIPRI) and Yifei Zhu (ISDP) provide a critical examination of the PLA's technological transformation and its implications for European security. Their perspectives highlight both the advancements in China's military modernization and the complex challenges Europe faces in responding effectively. Throughout the interviews, both experts emphasized the role of military-civil fusion in accelerating China's defense capabilities. The PLA's strategic integration of emerging technologies—ranging from artificial intelligence and quantum encryption to naval and aerospace advancements—demonstrates a significant shift in global military dynamics. As Yuan and Zhu pointed out, while these developments may not pose an immediate threat to Europe, they warrant increasing attention due to their long-term geopolitical ramifications, particularly for transatlantic

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security cooperation—even more under the context of a Trump 2.0 administration.

The discussion on vulnerabilities revealed the growing risks associated with cyber threats and dual-use technologies. The blurring of lines between civilian and military applications challenges existing regulatory frameworks and underscores the urgency of enhanced technological screening mechanisms. Both experts acknowledged that while Europe has strengthened its awareness of these challenges, gaps remain in preparedness, capacity-building, and strategic foresight. Zhu, in particular, stressed that Europe's regulatory frameworks must balance openness with the need to prevent unwanted technological transfers—an ongoing struggle that requires better coordination within the EU and with external partners.

Regarding response strategies, the discussion underscored Europe's need to reinforce its technological edge, invest in defense innovation, and foster strategic partnerships, both transatlantic and with Indo-Pacific allies. The interview was conducted before the U.S. presidential elections, but the uncertainty that has been stressed is more than ever relevant under the current leadership of Donald Trump. It adds an element of uncertainty to Europe's security landscape, with potential shifts in transatlantic coordination influencing Europe's strategic calculus. Yuan and Zhu both highlighted the importance of maintaining established frameworks such as NATO and the EU-U.S. Trade and TTC to ensure a coherent approach to security challenges posed by China's military rise.

Looking ahead, proactive European responses will be critical. Strengthening EU institutions' role in security policy, enhancing strategic coordination among member states, and deepening engagement with Indo-Pacific partners could help Europe navigate this evolving security landscape. Furthermore, as both experts suggested, while competition with the PLA is intensifying, maintaining channels for dialogue and crisis management remains essential to prevent miscalculations and conflicts.