

Ponder the Improbable

since
1996

FUTURE CONFLICTS – LESSONS LEARNED FROM UKRAINE

Event Report

22-23 November 2022

RSiS

S. RAJARATNAM
SCHOOL OF
INTERNATIONAL
STUDIES

Nanyang Technological University, Singapore



**NANYANG
TECHNOLOGICAL
UNIVERSITY**
SINGAPORE

FUTURE CONFLICTS – LESSONS LEARNED FROM UKRAINE

22-23 November 2022

TABLE OF CONTENTS

Executive Summary	4
Panel 1: Reflections on the Changing Character of Conflicts and Warfare	7
Panel 2: The Russia-Ukraine War – A Net Assessment	9
Panel 3: Lessons Learned – Perspectives from Northeast Asia	11
Panel 4: Lessons Learned – Perspectives from Southeast Asia	13
Panel 5: Strategic Implications for East Asia	15
Biographies of Speakers	17
Workshop Programme	27
About the Military Transformations Programme	33
About the Institute of Defence and Strategic Studies	34

Report of a workshop organised by the Military Transformations Programme, Institute of Defence and Strategic Studies (IDSS), S. Rajaratnam School of International Studies (RSIS), Nanyang Technological University (NTU), Singapore.

Edited by:

Michael Raska

Rapporteurs:

Richard Bitzinger

Wichuta Teeratanabodee

This report summarises the proceedings of the workshop as interpreted by the assigned rapporteur(s) and editor(s) appointed by the S. Rajaratnam School of International Studies, Nanyang Technological University. Participants neither reviewed nor approved this report.

This workshop adheres to a variation of the Chatham House Rule. Accordingly, no attributions are included in this workshop report.

Executive Summary

Russia's ongoing invasion of Ukraine has busted many myths, perhaps none more than the myth that, over the past decade or so, Russia has successfully transformed and modernised its armed forces. Nevertheless, since the start of the Russian offensive in Ukraine on February 24, 2022, military analysts and strategic thinkers have been observing the conflict's developments, trying to ascertain potential lessons learned. Much of the discussion, however, has been limited to Western and Russian debates, with implications on the future of Asian armies nearly absent.

This workshop sought to redress this deficiency. The RSIS Military Transformations Programme (MTP) has long explored long-range trends and developments regarding future warfare in East Asia. MTP has focused on issues such as future forms of hybrid warfare, emerging technologies, and the future of defence innovation. This workshop specifically sought to address how the on-going war in Ukraine might impact future warfare in East Asia, particularly:

- How is the character and conduct of warfare in the 21st Century evolving, based on outcomes so far in the Russo-Ukrainian war?
- How might lessons from the Russo-Ukrainian war manifest themselves in terms of military competitions as they affect the South China Sea and the Taiwan Strait?
- Are there specific lessons that militaries in Northeast and Southeast Asia may draw from the Russo-Ukrainian war in terms of future defence modernisation and transformation plans?

Key findings:

- i. While the warfighting experience in the Russian war in Ukraine is unique and thus limits generalisation, it is possible to identify some of the experiences that may be transferable to conflicts in other regions. There are several critical aspects of the warfare that the on-going conflict in Ukraine has highlighted.
- ii. The Russian war of aggression against Ukraine shows doctrinal, structural, and technical capability gaps of Western armed forces in the area of high-intensity warfare. While it is too early to draw definitive conclusions, one can draw a broader hypothesis from the combat operations in Ukraine for conventional force development in both East

Asia & Europe. Central to any military reform at the tactical and operational levels of war must be the effective execution of combined arms manoeuvre.

- iii. To date, neither the Russian nor the Ukrainian armed forces are capable of conducting combined arms operations — the effective integration and coordinated use of different military platforms, systems, and general capabilities in military operations — on a large scale. With the exception of the United States, no other Western country is capable of conducting brigade-level military operations of this kind. As combined arms operations lay the foundation for future multi-domain operations, this capability gap must be addressed quickly.
- iv. Russian intelligence failures in the initial period of the war, regarding both Ukrainian capabilities and attitudes, as well as the expected level of Western resistance has spurred a series of tactical and operational failures at the onset of the invasion. Western countermeasures targeting the Russian “information confrontation”, not least the US disclosures of classified information, had a strategic impact on achieving Western unity and generating support for Ukraine.
- v. Two main developments are going to impact future warfare – the proliferation and availability of combat drones for longer-range, more sophisticated operations, and the absolute necessity to have inexpensive tactical drones for close-support operations. The use of thousands of such drones in the war in Ukraine enabled persistent observation of adversary positions, movements, manoeuvres, and combat, with both sides admitting that these quadcopters are “everywhere”, necessitating a change in ground combat tactics, manoeuvring, and camouflage.
- vi. The development and employment of dual-use technologies in wartime have shed light on the role of the private sector, particularly private companies. We will likely see an increasing involvement of these actors in future warfare. In future conflicts, the high-tech private sector and its supply chains could be potential targets.
- vii. Conventional weapons, namely precision-guided missiles and self-detonating drones, are utilised against Ukrainian critical infrastructure and military targets instead of cyber operations, bringing into question the utility of cyber operations in full scale wars. Cyber options remain a potent method to shape a conflict or infiltrate a trusted source but are limited in the ability to alter the dynamics of a conventional war, so far.

- viii. The Russian invasion of Ukraine has worsened prospects for Russia's defence exports to Southeast Asia due to a combination of sanctions and export controls, the increased threat of CAATSA measures, and the damage done to Russian weaponry. The war has been a public relations disaster for Russia's defence industrial sector due to the high attrition rates suffered by Russia's armed forces in Ukraine, including the destruction of large numbers of tanks, helicopters, warships, fighter aircraft, and infantry fighting vehicles. Moreover, to replenish those losses, military equipment manufactured for export is now being diverted to the armed forces. It seems highly unlikely that Russia can ever resume its number one position in Southeast Asia.
- ix. Geopolitically, the Ukrainian War links Russia, Iran, China, and North Korea into a Eurasian Threat Belt. All have different interests, but they are unified against the West and have significant military capabilities (but different war fighting skills). Correspondingly, there is a greater need for Asia-Europe security partnership between NATO and Asia-Pacific 4 (South Korea, Japan, Australia, and United States), including the need for intelligence sharing, collaboration, and coordination; defence technology cooperation, joint weapons development; and bilateral arms sales.
- x. For East Asia, the war in Ukraine demonstrates the possibility that hegemonic trends seeking change of the status quo by force or other forms of coercion can lead to military aggression. Consequently, major militaries in East Asia will undergo a profound defence transformation over the next decade, focusing not only on deterrence, but increasingly on sustaining high levels of military readiness across multiple operational domains.
- xi. Yet, while the attention on modern warfare is often given to advanced technological development and acquisition, technology alone cannot guarantee operational success. What one imagines of a future battlefield is NEVER replicated in a computer screen, tabletop exercises, or command post drills. This is one of the main lessons from the war in Ukraine — "Nintendo Armies" do not matter in real wars, particularly for armies that are fixated with high-tech weapons.

Panel 1: Reflections on the Changing Character of Conflicts and Warfare

The first panel addressed how the Russia-Ukraine war reflected the changing character of warfare in the 21st century. It opened with a discussion on how the way we think about warfare and the character of war is overly structural and fatalistic. In other words, we extrapolate from structure, such as technology, and the recent past. Moreover, we are “fatalistic” as we tend to focus only on identifiable things and assume that this is just the way things (i.e., warfare and the character of war) are and always will be: there is not much we (or the enemy) can do about it. However, the panellists pointed out that warfare is not independent of those who wage it, although it can generate dynamics via adversarial interaction, which are often hard to control. Rather, the character of war is the product of multiple cooperating and competing agencies in strategy, working in the context of structures but not controlled by them. Describing “future warfare” usually suffers the same pitfalls as analysing the character of war, emphasising structure, being overly fatalistic, and lacking agency and specificity, resulting in concepts with too much potential for distraction and too little meaningful analytical or strategic value to contribute to a potential theory of success. Agency and specificity, in fact, drive everything, as war always possesses plural characters and warfare has innumerable futures, meaning there is no one concept of future warfare. These open-ended questions will have an impact on our ability to apply the lessons of Ukraine to future warfare in the Asia-Pacific.

The discussion then shifted to the question of what made possible the specific character of the war in Ukraine. At least one panellist argued that the war is best understood as a nuclear-era limited war, albeit with potential to transform the character of modern war by redirecting the meaning and role of nuclear weapons. The war so far is limited both in terms of its ends – limited territorial goals, despite some ambitious declared objectives (i.e., “de-Nazifying” Ukraine) – and its means: no use of nuclear weapons, an emphasis on battlefield attrition, attacks on energy infrastructure but no deliberate policy of killing civilians. At the same time, the war shows redirection and change in the modern concept of nuclear-era limited war. For the first time, a nuclear-armed great power is engaged in a large-scale conventional invasion, explicitly or implicitly attempting to protect its gains from a conventional counterattack through nuclear deterrent threats. In other words, nuclear weapons have shifted from being defenders of the status quo to being instruments of aggression. The war in Ukraine, therefore,

highlights the perils of the logic of nuclear-era limited war, should there be an escalation in the number of actors engaged in the war (e.g., Russian attacks on the Baltic states, Poland, Romania, and other NATO countries), an expansion in war aims (e.g., calls for regime change in Russia), or an expansion in the ways and means of warfare (e.g., increased air attacks, attacks on civilians, or even the use of tactical nuclear weapons).

Panel 2: The Russia-Ukraine War – A Net Assessment

This panel opened with one speaker noting how wrong so many had been about the war at its onset. Firstly, the Russia-Ukrainian conflict really “started” in 2014, with Russia’s illegal annexation of Crimea. In addition, too many (Russia, but also those in the West) underestimated the resilience of the Ukrainian people and the effectiveness of the Ukrainian armed forces, while also overestimating Russia, especially its “cognitive warfare” efforts. Rather, Ukrainian improvements in “DOTMLPFI-P” (i.e., doctrine, organisation, training, materiel, leadership and education, personnel, and facilities) in recent years has had a substantial impact on national defence in terms of policy, doctrine, and organisation, affecting territorial defence, civil preparedness, and interoperability.

This panel also touched on the importance of combat and loitering drones, and counter-UAV systems in future warfighting. Two main developments are going to impact future war: the proliferation and availability of combat drones for longer-ranged complex operations; and the need for cheap tactical drones for close-support operations. The availability and appeal of relatively cheap, armed drones from new suppliers will impact drone acquisition around the world, with nations lining up to acquire UAVs that have been battle-proven in Ukraine, such as the Turkish Bayraktar TB 2 (and possibly the Iranian-made Shahed-136/1 loitering drone). Moreover, the use of cheap commercial drones (such as Chinese-made DJIs) in Ukraine for ISR, combat, artillery spotting, information operations, and psychological operations also demonstrate that real capacity need not come via expensive and bureaucratic defence acquisition pipelines. One should expect to see small UAVs as a constant presence on the modern battlefield, with smaller units at the platoon and company levels possessing their own capability to conduct reconnaissance and even combat missions. At the same time, the profusion of drones raises the importance of counter-UAV capabilities, at the tactical and operational levels, with systems and technologies that can jam, disable, and ultimately bring down enemy drones. With both Russian and Ukrainian combatants now using hand-held counter-UAV systems, nations interested in acquiring similar technology will see how such systems perform in this war.

It was also argued that the Russo-Ukrainian war reveals manifest doctrinal, structural, and technical capability gaps of Western armed forces in the area of high-intensity warfare. While it is too early to draw definitive conclusions, one can draw some broader hypotheses from the combat operations in Ukraine for conventional force development in both Asia and Europe. Central to any military reform at the tactical and operational levels of war must be the effective execution

of combined arms manoeuvre. Perhaps the most negative impact of the long-term effective development and adaptation of Asian and European armed forces is the assumption that Ukraine's successes in this war are due to the application of Western military doctrine.

Additionally, neither the Russian nor the Ukrainian armed forces can carry out combined arms operations – the effective integration and coordinated use of different military platforms, systems, and general capabilities in military operations – on a large scale. The heavy casualties on both sides in this war can largely be attributed to the inability to practice such an integrated mode of fighting. As combined arms operations lay the foundation for future multi-domain operations, this capability gap must be addressed quickly. The war also demonstrates how much future high-intensity warfare will be characterised by high manpower and materiel losses. Consequently, the ability to fight combined arms must be continuously developed within both Asian and European armed forces. Asian and European forces must also close capability gaps when it comes to intelligence, surveillance, target acquisition, and reconnaissance (ISTAR) to conduct military operations, including long-range precision strikes, in a high-intensity operational environment.

Finally, it was noted that the warfighting experience in the Russian war in Ukraine may be unique, thus limiting generalisation. Nonetheless, there are several critical aspects of the warfare that the on-going conflict has highlighted, including the critical role of Russian intelligence failures at the beginning of the war; the importance of Western counter-measures targeting the Russian “information confrontation”; the failure of the Russian concept of mobile attack echelons with airborne troops deployed with helicopters; the key role of preserving Ukrainian air defence systems that denied Russia air superiority; the impact of international cooperative cyber defence; the corrosive effect of the Russian military leadership and the lack of a flexible chain of command; low morale among Russian troops; shortage of Russian manpower; poor Russian logistics; and weaknesses in Russian ISTAR. Meanwhile, Ukraine was able to effectively employ its territorial defence and get around Russian electronic warfare by using Western technologies (such as SpaceX's Starlink) which were not as affected. Lastly, in a war of attrition such as the one in Ukraine, quantity is as equally important as quality. To sustain warfighting capability, it is necessary to have the ability to switch to a war economy to provide a large number of trained personnel and stockpiles of weapons.

Panel 3: Lessons Learned – Perspectives from Northeast Asia

This panel opened with an assertion that the Russo-Ukrainian war demonstrated that major global conflict is still quite possible, and that war is not a “Nintendo game”, or an incident to be taken lightly. Traditional geopolitical threats (e.g., within an emerging “Eurasian threat belt”, comprising Russia, Iran, China, and North Korea) still exist. At the same time, new technologies — particularly artificial intelligence (AI), drones and other lethal autonomous weapons (LAWS), hypersonic missiles, and cyber — will increasingly impact warfighting. Beyond technologies, if the West and its allies are going to oppose the nations of this new threat belt, then a new “trilateralism” aligning the United States, NATO, and the democratic nations in Asia-Pacific, specifically Australia, Japan, and South Korea, is essential, and it must be empowered by effective leadership and a will to fight.

The panel then touched on security in Northeast Asia from a macro perspective, with some arguing the region must remain vigilant against the possibility that hegemonic trends seeking to change the status quo by force or coercion could lead to military aggression. Unlike Western Europe, there is no collective security mechanism like NATO in this region. It has been customary to ensure regional security through bilateral alliances with the United States, known as the hub and spoke security framework, and defence efforts by each country in the region. There has been an idea to combine the existing regional frameworks of Quad, AUKUS, Five Eyes, and the Free and Open Indo-Pacific (FOIP) initiatives in a multi-layered manner to ensure security equivalent to collective defence, but the realisation of this idea still requires time and effort.

Drawing on the lessons of Ukraine’s invasion, some panellists argued for stronger and more active multilateral cooperation. This can be achieved through a further strengthening of regional frameworks for multilateral security and defence cooperation. Additionally, emphasis must be given to the active incorporation of advanced technologies. Considering that Russia has repeatedly conducted and will continue to conduct hybrid warfare, it is necessary to prepare for counter-hybrid warfare by combining military and non-military means and utilising the fusion of real and virtual space to ensure superiority in the new warfighting. On the military front, it is also clear that countries should enhance their defence capabilities in the cyber, space, and cognitive domains, as Russia’s hybrid warfare has not had the desired effect through Western coordination and cooperation.

The panel also touched on the importance of science and technology in international relations; technological prowess and innovation capacities have become the primary determinants of a country's overall strength. During the Russo-Ukrainian War, both countries utilised deep learning, and social bots to propagate and advertise false news to manipulate public opinion, as well as facial recognition technology and the use of AI-enabled autonomous weapons to attack enemy forces, with prominent success. Future warfare is predicted to be dominated by AI and algorithms. Under conditions of power transfer or imbalance, the phenomena of power extremes will intensify. Frictions, disagreements, and anxieties between nations raise the likelihood of war. This new technological revolution represented by AI may propel a nation's foreign strategic decisions to shift towards offensive realism, impeding the process of standardising global governance. Moreover, the advent of AI has accelerated the demise of the liberal international order. On the one hand, competitive factors in the international environment have increased while cooperative factors have decreased; on the other hand, the degree of interdependence between countries has decreased, diminishing the country's sense of identification with international laws and order. It is possible that "zero-sum, isolation, and disorder" will define the next phase of the international order.

Panel 4: Lessons Learned – Perspectives from Southeast Asia

This panel discussed several possible ramifications of the Russo-Ukrainian war for Southeast Asian militaries, particularly Malaysia, Indonesia, and Vietnam. The panellists argued that the war demonstrated conventional conflicts are both conceivable and even likely, and that Southeast Asia must increasingly prepare for them in terms of building up its regional military defences. They should increase defence spending and accelerate procurement plans. At the same time, the war demonstrates the importance of possessing more flexible command and control structures, particularly when future forces are likely to be operationally more mobile, agile, and rapidly deployable.

It was also noted that the war has undercut Russian arms exports to Southeast Asia. Russia used to be the leading arms seller to the region, and it filled critical defence needs for many regional militaries, particularly when it came to fighter aircrafts, man-portable air-defence and anti-tank weapons, and helicopters. Factors undermining Russian arms sales to the region include the US CAATSA legislation, which threatens penalties against countries who buy weapons from Moscow, as well as growing competition from new arms suppliers, such as China, Turkey, and South Korea. Meanwhile, the poor performance of Russian weaponry in the Russo-Ukrainian war has raised concerns in many Southeast Asian nations as to the quality and effectiveness of Russian weapons.

Nevertheless, the panellists noted that it may be difficult for Southeast Asian nations to oppose Russian aggression against Ukraine. While most voted in favour of UN resolutions condemning Moscow for its invasion, only few have signed any sanctions against Russia. Civil society's attitudes towards the war are also divided, partly due to Russia and Ukraine's engagements in information campaigns. In Vietnam, for example, pro-Russian attitudes are common among more conservative and older generations, many of whom used to study, work, and live in Russia, and people with former affiliations with the military and public security sectors; these groups are still grateful for the Soviet Union's assistance to North Vietnam during the war against America and see Russia as a longstanding and trusted friend of Vietnam. Many of them also support Putin, who, in their belief, could restore Russia to its greatness and play an important role in reviving Vietnam-Russia relations. In other Southeast Asian countries, anti-Western sentiments have limited efforts to punish Moscow. Moreover, Southeast Asian militaries might find it hard to resist the appeal of Russian arms deals, which often come without political strings and with innovative payment schemes.

In sum, the Russo-Ukrainian War is a clear indicator of the need for Southeast Asian militaries to reconsider and reform their doctrine, strategies, and force structure. On the political side, it is apparent that most countries in the region will be reluctant to sanction Russian aggression.

Panel 5: Strategic Implications for East Asia

The workshop closed with a general exploration of how the Russo-Ukrainian war might affect politics and warfighting in East Asia over the near and mid-term. One panellist argued that instead of Ukraine becoming the test bed for modern warfare, the war became a testing ground for core theories of technology and its impact on international security. In particular, the predicted “cyber thunder-run” by Russia — i.e., a quick burst of cyberattacks to pave the way for conventional forces — never occurred. Instead, conventional weapons, such as precision-guided missiles (PGMs) and self-detonating drones, were utilised against Ukrainian critical infrastructure and military targets instead of cyber operations, bringing into question the utility of cyber operations in full-scale wars. Cyber options remain a potent method to shape a conflict or infiltrate a trusted source but are limited in their ability to alter the dynamics of a conventional war, so far. Moreover, there is little evidence of coordinated or multi-domain operations, coercive operations that alter battlefield calculations, or severe cyber operations generating concessions that would signal a revolution in warfare. The outcome of the cyber conflict in Ukraine has been more restrained than most thought possible.

Regarding China, it was argued that the Chinese military will likely learn from Ukraine’s success and seek to prepare the environment for a conflict of their choosing. Yet, it seems that cyber defence is ascendant and if targeted countries focus on mitigating risks, collaborating with allies and partners, and not buying into the hype of offensive cyber weapons, any future conflict in the East Asian region will likely witness much of the same outcomes as Ukraine has.

Nevertheless, it was also pointed out during this panel session how difficult it will be for some Asia-Pacific nations to stand up to the kind of military aggression perpetrated by Russia on Ukraine. One panellist, for example, noted that Hanoi, given its close and historical ties to Russia, has not been willing to criticise Moscow’s invasion. Vietnam has become known as a “swing state” in great power conflict between the three great powers. At the same time, Hanoi is trying to pursue its national goals through its “bamboo policy” and its “Four No’s” policy. Vietnam intimately knows the challenges that smaller countries face when bordering a giant neighbour, and it also understands the array of potential challenges when engaging with all three countries. Therefore, it will continue to maintain a low profile on the Ukraine war while diversifying and multilateralising its

external relations. With the United States, for example, Vietnam has emphasised the importance of focusing on economic and strategic cooperation while deemphasising human rights. With China, Vietnam has used ideological common ground to manage conflict in the South China Sea. With Russia, Vietnam has begun a degree of diversification while maintaining its importance as a trading partner.

Finally, the panel noted that the Russo-Ukrainian war is by no means over, making it difficult to be definitive about long-lasting impacts. There is still a need to study the situation case-by-case and understand the significance of differences in circumstances and conditions. There is likely to be only a limited direct impact on the probability of contingencies in both the Taiwan Strait and the Korean Peninsula (i.e., no “spill-over” effect nor a lower threshold for conflict). The geopolitical, strategic, and military conditions in East Asia are far different from those in Russia and Ukraine.

The real implications will be those that shape the way states manage their strategies and readiness, and in this regard current and emerging trends are becoming evident in East Asia. There are, for example, raised concerns in Japan, South Korea, and Taiwan that the threat and risks of attacks, invasions, and wars are real. There is also a greater consciousness (or reminder) about how wars unfold and the interconnectivity of conflicts. This is less a change in strategic aims and objectives and more a reconfiguration in defence planning for enhanced readiness as China and North Korea continue to modernise their forces. The Russo-Ukrainian war puts into sharper focus the need for a variety of new understandings, including the impact of new and emerging technologies, the growing criticality of operational readiness (especially munitions and logistics), hybrid warfare, and jointness – all areas highlighted by Russia’s operational and tactical failures. Finally, the war has highlighted the importance of alliances and defensive networks and the need to ensure sufficient resources (particularly defence spending) to attain necessary levels of readiness and close the gaps between strategies, policies, and readiness.

Biographies of Speakers

**In alphabetical sequence, according to last/family names*

Samuel Bendett is an adviser with CNA's Strategy, Policy, Plans, and Programs Center, where he is a member of the Russia Studies Program. He is also an adjunct senior fellow at the Center for a New American Security. His work involves research on Russian defence and technology developments, unmanned and autonomous military systems, and artificial intelligence, as well as Russian military capabilities and decision-making during crises. He is an honorary mad scientist with the US ARMY TRADOC's Mad Scientist Initiative. He is also a Russian military autonomy and AI SME for the DOD's Defense Systems Information Analysis Center. Prior to joining CNA, Mr Bendett worked at the National Defense University on emerging and disruptive technologies for the Department of Defense response in domestic and international crisis situations. His previous experience includes working for US Congress, the private sector, and non-profit organisations on foreign policy, international conflict resolution, defence, and security issues. Mr Bendett's analyses, views and commentary on Russian military robotics, unmanned systems, and artificial intelligence capabilities appear in the Washington Post, Voice of America, Forbes, C4ISRnet, DefenseOne, War on the Rocks, Breaking Defense, Popular Science, The National Interest, and The Strategy Bridge. Mr Bendett received his MA in Law and Diplomacy from the Fletcher School, Tufts University and BA in Politics and English from Brandeis University. He has native fluency in Russian.

Richard A. Bitzinger is a visiting senior fellow with the Military Transformations Program at the S. Rajaratnam School of International Studies (RSIS), where his work has focused on security and defence issues relating to the Asia-Pacific region, including military modernisation and force transformation, regional defence industries and local armaments production, and weapons proliferation. He was previously a senior fellow at RSIS from 2006 to 2018, and headed the Military Transformations Program from 2012 to 2018. He has written several books, monographs, and book chapters, and his articles have appeared in journals such as the International Security, Orbis, China Quarterly, and Survival. He is the author of *Arming Asia: Technonationalism and Its Impact on Local Defence Industries* (2017), and *Military-Technological Innovation in Small States: The Cases of Israel and Singapore* (Journal of Strategic Studies, 2021). He has previously worked at the RAND Corporation, the Centre for Strategic and Budgetary Affairs, the Asia-Pacific Centre for Security Studies, and the US Central Intelligence Agency.

John Frederick Bradford is a senior fellow in the Maritime Security Programme at the S. Rajaratnam School of International Studies (RSIS), Nanyang Technological University. Mr Bradford holds a MSc in Strategic Studies from RSIS (gold medal winner) and BA (Magna Cum Laude in Asian Studies) from Cornell University. He retired from the US Navy with the rank of Commander. His US Navy assignments included service as the deputy director of the 7th Fleet Maritime Headquarters, as country director for Japan in the Office of the Secretary of Defense-Policy, and as commanding officer of a ballistic missile defence-capable Aegis destroyer forward deployed to Japan. His research interests focus on Indo-Pacific maritime issues and security cooperation. His work can be found in publications such as *Contemporary Southeast Asia*, *Asia Policy*, *Asian Security*, *Asian Survey*, *Naval War College Review*, and *Naval Institute Proceedings*. He has also written book chapters, online articles, and monographs published by leading international think tanks.

Dingding Chen is professor of International Relations, associate dean of Institute for 21st Century Silk Road Studies at Jinan University, Guangzhou, China; and non-resident fellow at the Global Public Policy Institute (GPPi) Berlin, Germany, and SAIS at Johns Hopkins University. He was the vice-president of International Studies Association (Asia Pacific region 2014-2018). He is also the founding director of Intellisias Institute, a newly established independent think tank focusing on international affairs in China. His research interests include Chinese foreign policy, Asian security, Chinese politics, and human rights. His articles have appeared in *International Studies Quarterly*, *International Security*, *Journal of Contemporary China*, *Chinese Journal of International Politics*, and *The Washington Quarterly*. He is the co-editor of a book on international engagement with human rights in China. Before teaching at University of Macau between 2009 and 2016, he was a visiting instructor in the Government Department at Dartmouth College and was also a China and the World Program fellow at Harvard University. He holds a bachelor's degree in International Economics from the Renmin University of China and a master's degree and PhD in Political Science from the University of Chicago.

Thomas Daniel is a senior fellow in the Foreign Policy and Security Studies programme. His interests lie in strategic-security challenges of Southeast Asia, including the impacts of major power dynamics on ASEAN. Within this, he looks mainly at the South China Sea dispute, political-security cohesion within ASEAN, and Malaysia's security and foreign policies. He also focuses on government policies (or lack thereof) for refugees, asylum seekers, and other displaced people in Malaysia. He writes and speaks of these issues in local and regional forums and has commented on them in local and international media. Thomas holds an MA in International Studies from the University of Nottingham (Malaysia), a BA in Communication and Media Management, and a BA (Hons) in Communication, Media & Culture from the University of South Australia. He was a public relations practitioner focusing on media engagement strategies for government and enterprise-technology agencies.

Tiana Desker is director (Strategic Futures & Emerging Tech) in the Defence Policy Office at the Ministry of Defence, Singapore. In that role, she oversees scenario planning, as well as research and strategy for topics at the intersection of geopolitics and emerging technologies. She was previously deputy head of the Centre for Strategic Futures at the Prime Minister's Office, Singapore. Tiana began her career as a policy analyst in the Ministry of Defence, covering Southeast Asia.

Franz-Stefan Gady has advised militaries in Europe and the United States on structural reform and the future of armed conflict. Prior to joining the IISS, he held various positions at the EastWest Institute, the Project on National Security Reform, and the National Defence University. He conducted field research in Afghanistan, Iraq, and Ukraine, where, among other things, he embedded with the Afghan National Army, NATO forces, Kurdish militias, and the Ukrainian Armed Forces. Franz-Stefan has also reported from a wide range of countries and conflict zones as a journalist. He is the author of a number of monographs and book chapters on Asian and European security issues.

Ryo Hinata-Yamaguchi is a project assistant professor and executive director at the Research Center for Advanced Science and Technology Open Laboratory for Emergence Strategies (ROLES) of the University of Tokyo and is also an adjunct fellow at the Pacific Forum. Ryo has presented, published, and consulted on a variety of topics relating to defence and security, and transport governance in the Indo-Pacific. Ryo previously served as a non-commissioned officer in the Japan Ground Self-Defence Force (reserve) and also held positions at the Pusan National University, Universitas Muhammadiyah Malang, FM Bird Entertainment Agency, International Crisis Group Seoul Office, Sasakawa Peace Foundation, Embassy of Japan in Australia, and the Japan Foundation Sydney Language Centre. Ryo received his PhD from the University of New South Wales, MA in Strategic and Defence Studies and BA in Security Analysis from the Australian National University, and was also a Korea Foundation language training fellow.

Huynh Tam Sang (PhD) is a lecturer in the Faculty of International Relations at the University of Social Sciences and Humanities, Vietnam National University-Ho Chi Minh City; a research fellow at Taiwan NextGen Foundation, and a non-resident WSD-Handa fellow at the Pacific Forum. His main fields of interest are East Asian international relations, Vietnam's foreign policy, and middle-power diplomacy, with special reference to Vietnam, Australia, and Taiwan. His recent focus has been on security in the South China Sea, cross-Strait relations, Taiwan's New Southbound Policy, and Taiwan's foreign relations. Sang has written for *The National Interest*, *East Asian Policy*, *The Diplomat*, *ISEAS Perspective*, *East Asia Forum*, *The Interpreter*, *Asia Maritime Transparency Initiative*, *Fulcrum*, *Taiwan Insight*, *Taipei Times*, *Policy Forum*, *9DashLine*, among others.

Doug Krugman is currently the US Marine Corps attaché to Singapore. He graduated from Tulane University with honours in History and Political Science. He has served as an infantry officer in multiple battalions, deploying to Iraq, Afghanistan, and at sea with Marine Expeditionary Units. As a foreign area officer, he studied at the Naval Postgraduate School, US Foreign Service Institute, and Gadjah Mada University. He served in a training assignment at the US Embassy in Jakarta and as a faculty member at the Asia-Pacific Center for Security Studies. In 2016-2017 he was the second in command of the US Marine Corps experimental infantry battalion for future force design. From 2018-2019 he served as the operations officer for the newly re-designated I Marine Expeditionary Force Information Group which integrated multi-modal communications, defensive cyber operations, electronic warfare, intelligence, psychological operations, strategic communications, and other information-related capabilities. He is a graduate of the Marine Corps' Basic School (CG's honour role), Infantry Officers' Course, Amphibious Warfare School (non-resident), Naval War College Command and Staff program (seminar program, with distinction), Marine Corps Command and Staff College (with distinction), Air War College (distance learning program), and various other training courses.

Evan A. Laksmana is senior research fellow at the Centre on Asia and Globalisation of the National University of Singapore's Lee Kuan Yew School of Public Policy. He is also a non-resident scholar with Carnegie China and the Lowy Institute for International Policy. He was previously a senior researcher at the Centre for Strategic and International Studies in Indonesia and the Wang Gungwu visiting fellow at the ISEAS-Yusof Ishak Institute. He has held research and visiting positions with the National Bureau of Asian Research, Sydney University's Southeast Asia Centre, German Marshall Fund of the United States, and the S. Rajaratnam School of International Studies. His peer-reviewed research has appeared in *Journal of Contemporary Asia*, *Asian Security*, *Asian Politics & Policy*, *Defence Studies*, *Defense & Security Analysis*, *Asia Policy*, *Contemporary Southeast Asia*, and others. He has also written for *Foreign Policy*, *Foreign Affairs*, *New York Times*, among others, and has contributed to RAND, Brookings Institution, Asia Society Policy Institute, International Institute for Strategic Studies, and others. He has consulted for the Peace Research Institute Oslo (PRIO), UNODC Global Maritime Crime Programme, and other international institutions and government agencies. He earned his PhD in Political Science from Syracuse University's Maxwell School of Citizenship and Public Affairs as a Fulbright Presidential Scholar.

Lee Chung Min is a senior fellow at the Carnegie Endowment for International Peace in Washington, DC and professor at the Institute of Convergence and Security Affairs, Korea Advanced Institute for Science and Technology. Prior to joining Carnegie, he taught for 20 years at the Graduate School of International Studies (GSIS) at Seoul's Yonsei University, and was South Korea's ambassador for National Security Affairs from 2013–2016. A former dean of GSIS (2008–12) and Underwood International College (2010–12), he has also served more than a decade at leading think tanks in the United States and Asia, including the RAND Corporation, Sejong Institute (Seoul), and National Institute for Defense Studies (Tokyo). Chung Min is a chairman of the Advisory Council of the International Institute for Strategic Studies (IISS).

Lukas Milevski is a (tenured) assistant professor at Leiden University, where he teaches strategic studies in the BA International Studies and MA International Relations programmes. He is also a Baltic Sea fellow at the Foreign Policy Research Institute in Philadelphia and is associated with the Changing Character of War Centre at the University of Oxford. Milevski is a prolific writer and speaker. He has published two books with Oxford University Press: *The Evolution of Modern Grand Strategic Thought* (2016) and *The West's East: Contemporary Baltic Defense in Strategic Perspective* (2018). He has published widely on strategy, including in *Survival*, *Journal of Strategic Studies*, *Orbis*, and numerous other international academic and professional journals. He also guest lectures frequently to international military and academic audiences. He completed his PhD with Colin Gray at the University of Reading, 2011-2014 and in 2010 was the youngest winner of the Trench Gascoigne Essay Prize offered by the Royal United Services Institute in the award's entire history.

Nagashima Jun is a senior research adviser at the Nakasone Peace Institute. Lieutenant General Nagashima served as a Government of Japan cabinet councillor starting in August 2013 and as deputy assistant chief cabinet secretary, National Security Secretariat, from January 2014. He is the first military officer to hold the position of cabinet councillor in Japan. As an intelligence expert, his extensive career includes critical assignments as defense attaché, liaison officer to NATO and the EU, Embassy of Japan in Belgium; director, Logistics (J-4), Joint Staff Office; and defense intelligence Officer, Defense Intelligence Headquarters. He is a graduate of the National Defense Academy and earned his master's degree in European Security from Tsukuba University. He attended the "Generals, Flag Officer and Ambassador Course" at the NATO Defense College and "Transnational Security Cooperation Course" at Asia Pacific Center for Strategic Studies (APCSS). He is a prolific writer of academic essays, including Proliferation of Ballistic Missile and Security of East Asia (The Journal of National Defense (Nov,1994)) which won the prestigious 1994 Kamiya Fuji prize, UK–Japan cooperation in response to electronic warfare, Chatham House, the Royal Institute of International Affairs (March, 2021), Will the digital nation Ukraine triumph over Russia? Nikkei BP (July, 2022), etc.

Oksana Osadcha is associate of the International Defence Hub of the European Values Centre for Security policy (Czech Republic) and program director of the PROTECT (Promoting Reform Objectives through Technical Expertise and Capacity Transfer) project, established under the Memorandum between the Governments of Canada and Ukraine since 2022. Between 2013-2021 she was senior political analyst of the NATO Representation to Ukraine and was responsible for political reporting and analysis, providing analytical and organisational support to NATO's advisory efforts and practical cooperation with Ukraine. In 2013, Ms Osadcha earned a PhD in International Politics from the Institute of World Economy and International Relations of the National Academy of Sciences of Ukraine. Previously, she developed a career in the Institute of the World Policy, a leading Ukrainian think-tank, as a project manager. Ms Osadcha is the author of several policy papers and articles on Ukrainian foreign policy, European and Euro-Atlantic integration. She is also a visiting lecturer at the courses organised by the NATO Professional Development Programme, as well as Kyiv Mohyla Business School "Strategic leaders in Security and Defence Sector" and "Strategic Architects" MPA programmes.

Michael Raska is assistant professor and coordinator of the Military Transformations Programme at the S. Rajaratnam School of International Studies, Nanyang Technological University in Singapore. His research interests and teaching focus on emerging technologies, strategic competition, and future warfare in the Indo-Pacific; theories and strategies relating to defence and military innovation; and plotting cyber conflicts and information warfare. He is the author of *Military Innovation and Small States: Creating Reverse Asymmetry* (Routledge, 2016), and co-editor of two volumes: *Defence Innovation and the 4th Industrial Revolution: Security Challenges, Emerging Technologies, and Military Implications* (Routledge, 2022), and *Security, Strategy and Military Change in the 21st Century Cross-Regional Perspectives* (Routledge, 2015). He has published in journals such as the *Journal of Strategic Studies*, *Strategic Studies Quarterly*, *Journal of Complex Operations*, *Air Force Journal of Indo-Pacific Affairs*, *Korea Journal of Defence Analysis*, and also in German, *Sirius – Zeitschrift für strategische Analysen*. His academic contributions also include chapters and policy reports in cooperation with the International Institute for Strategic Studies (IISS); Center for New American Security (CNAS); Norwegian Institute of Defence Studies (IFS); Strategic Studies Institute (SSI) at the US Army War College; European Union Institute for Security Studies (EUISS); Swedish Defence University (FHS); and in Germany, Institut für Sicherheitspolitik an der Universität Kiel (ISPK). In Singapore, he has lectured at the Goh Keng Swee Command and Staff College of the Singapore Armed Forces. Dr Raska attained his PhD from the National University of Singapore, where he was a recipient of the President's Graduate Fellowship.

Ian Storey is senior fellow at the ISEAS-Yusof Ishak Institute in Singapore. At ISEAS, he specialises in regional security issues with a focus on Southeast Asia's relations with the major powers and maritime security, especially the South China Sea dispute. Since joining ISEAS in 2007, he has been the editor of the academic journal *Contemporary Southeast Asia*. Prior to ISEAS, Ian held academic positions at the Asia-Pacific Center for Security Studies, Hawaii, and at Deakin University, Australia. Ian received his PhD from the City University of Hong Kong, his master's degree from the International University of Japan and his BA (Hons) from the University of Hull, England. He is the author of *Southeast Asia and the Rise of China: The Search for Security*.

Wichuta Teeratanabodee is a senior analyst in the Military Transformations Programme of the Institute of Defence and Strategic Studies, RSIS. Her research focuses on norms and governance for new domains of military technology, including outer space and underwater. She is also interested in regional security and politics in East and Southeast Asia. Wichuta graduated with an MSc in Strategic Studies from RSIS. She also holds an MSc in Development Studies from Lund University, Sweden.

Bich Tran is a visiting fellow at the ISEAS-Yusof Ishak Institute under the Vietnam Studies Program. She is also a non-resident fellow at the Center for Strategic and International Studies (CSIS) in Washington DC and a PhD candidate at the University of Antwerp. Her research interests include Vietnam's grand strategy, Southeast Asian states' relations with major powers, and political leadership. Ms Bich is the author of *From 'Rebalance to Asia' to 'Free and Open Indo-Pacific': The Development of the U.S.-Vietnam Comprehensive Partnership* (Asia Pacific Issues, 2019), *Presidential Turnover and Discontinuity in the Philippines' China Policy* (Asian Perspective, 2019), and the co-author of *Vietnam's Post-Cold War Hedging Strategy: A Changing Mix of Realist and Liberal Ingredients* (Asian Politics & Policy, 2018).

Brandon Valeriano serves as a distinguished senior fellow at the Marine Corps University and senior adviser to the Cyberspace Solarium Commission 2.0. He was most recently the Donald Bren chair of Military Innovation at the Marine Corps University at the Krulak Center. He had published numerous peer-reviewed journal articles and co-authored two books on cyber security and military strategy. Dr Valeriano has testified before Congress and the UK Parliament on cyber security issues and served as a senior adviser to the Cyber Solarium Commission, which has taken a lead in formulating cyber security strategy and legislative agendas for the United States. Since earning his PhD in Political Science from Vanderbilt University, Dr Valeriano has also written peer-reviewed articles, opinion pieces, and books on a range of other issues in international security.

Pascal Vennesson is a senior fellow and head of research at the S. Rajaratnam School of International Studies (RSIS), Nanyang Technological University, Singapore. He is also professor of Political Science at Paris-Pantheon-Assas University (on leave). His research and teaching lie at the intersection of the fields of international relations and strategic studies. He recently published *Military Power and Grand Strategy* in the Oxford Handbook of Grand Strategy (2021). Before joining RSIS, he held the chair “Security in Europe”, at the European University Institute, Robert Schuman Center for Advanced Studies. He also taught “Strategy and Policy” for 10 years at The Paul H. Nitze School of Advanced International Studies (SAIS)-Bologna Center. He is the author, co-author, and editor of six books and his refereed articles have been notably published in *Armed Forces and Society*, *International Relations*, *Journal of Strategic Studies*, *Journal of Global Security Studies*, *Review of International Studies*, *Revue Française de Science Politique*, and *Security Studies*. He is a member of the editorial boards of *Revue Française de Science Politique* (French Political Science Review), *Armed Forces and Society*, and the *European Journal of International Security*.

Katarzyna Zysk is professor of International Relations and Contemporary History at the Norwegian Institute for Defence Studies (IFS)/Norwegian Defence University College in Oslo (since 2007). At the IFS, she also served as deputy director, head of Centre for Security Policy, and director of research, and as acting dean of the Norwegian Defence University College. Previously, she was visiting professor at Stanford University’s Center for International Security and Cooperation (CISAC), The Changing Character of War Centre at the University of Oxford; research fellow at the Center for Naval Warfare Studies at the US Naval War College, and Sciences Po in Paris. Currently, she serves as core group member of the Russia Transatlantic Forum (Center for a New American Security); advisory board member of the Transatlantic Deterrence Dialogue Initiative; and non-resident senior fellow at the Atlantic Council. Following her PhD thesis (2006) on NATO enlargement, her research has focused on security, defence, and strategic studies, including Russia’s armed forces, military strategy, naval and nuclear strategies, security in the Arctic, disruptive technologies, and defence innovation. Her published research has appeared in *SAIS Review of International Affairs*, *Bulletin of the Atomic Scientists*, *Journal of Strategic Studies*, *Asia Policy*, *RUSI Journal*, *Politique Étrangère*, *International Relations*, *Jane’s Navy International*, *War on the Rocks*, as well as in books published by Oxford and Cambridge University Presses.

Workshop Programme

22 November 2022, Tuesday (Singapore Time / UTC+8)	
1.00 – 1.30 pm	REGISTRATION
1.30 – 1.40 pm	WELCOME REMARKS Dr Michael Raska <i>Coordinator, Military Transformations Programme Institute of Defence and Strategic Studies S. Rajaratnam School of International Studies Nanyang Technological University, Singapore</i>
1.40 – 2.00 pm	OPENING REMARKS Ms Tiana Desker <i>Director, Strategic Futures & Emerging Technologies Ministry of Defence, Singapore</i>

PANEL 1: REFLECTIONS ON THE CHANGING CHARACTER OF CONFLICTS AND WARFARE

Moderator

Mr Richard Bitzinger

Visiting Senior Fellow

S. Rajaratnam School of International Studies

Nanyang Technological University, Singapore

Speakers

**2.00 –
3.45 pm**

Dr Lukas Milevski

Assistant Professor

Leiden University

Dr Pascal Vennesson

Senior Fellow and Head of Research

S. Rajaratnam School of International Studies

Nanyang Technological University, Singapore

Lt Col Doug Krugman

Marine Corps Attaché

US Embassy Singapore

**PANEL 2: THE RUSSO-UKRAINE WAR –
A NET ASSESSMENT**

Moderator

Dr Michael Raska

*Coordinator, Military Transformations Programme
Institute of Defence and Strategic Studies
S. Rajaratnam School of International Studies
Nanyang Technological University, Singapore*

Speakers

**4.00 –
6.00 pm**

Dr Oksana Osadcha

*Policy Associate
European Values Center for Security Policy*

Mr Samuel Bendett (Virtual Presentation)

*Adviser, Russia Studies Program
Center for Naval Analyses*

Mr Franz-Stefan Gady (Virtual Presentation)

*Senior Fellow
International Institute for Strategic Studies (IISS)*

Dr Katarzyna Zysk (Virtual Presentation)

*Professor, Norwegian Institute for Defence Studies (IFS)
Norwegian Defence University College*

23 November 2022, Wednesday (Singapore Time / UTC+8)

9.30 –
10.00 am

REGISTRATION

10.00 –
12.00 pm

PANEL 3: LESSONS LEARNED – NORTHEAST ASIAN PERSPECTIVES

Moderator

Mr John Bradford

*Senior Fellow, Maritime Security Programme
Institute of Defence and Strategic Studies
S. Rajaratnam School of International Studies
Nanyang Technological University, Singapore*

Speakers

Dr Lee Chung Min (Virtual Presentation)

*Senior Fellow, Asia Program
Carnegie Endowment for International Peace*

Lt Gen (Ret.) Jun Nagashima

*Senior Research Adviser
Nakasone Peace Institute*

Dr Dingding Chen (Virtual Presentation)

*Professor of International Relations
Associate Dean, Jinan University*

PANEL 4: LESSONS LEARNED – SOUTHEAST ASIAN PERSPECTIVES

Moderator

Ms Wichuta Teeratanabodee

*Senior Analyst, Military Transformations Programme
Institute of Defence and Strategic Studies
S. Rajaratnam School of International Studies
Nanyang Technological University, Singapore*

Speakers

Mr Thomas Daniel

*Senior Fellow
Institute of Strategic and International Studies Malaysia*

Dr Evan Laksmana

*Senior Research Fellow
Lee Kuan Yew School of Public Policy
National University of Singapore*

Ms Bich Tran

*Adjunct Fellow
Center for Strategic and International Studies*

Dr Ian Storey

*Senior Fellow
ISEAS–Yusof Ishak Institute, Singapore*

1.00 –
3.00 pm

<p>3.15 – 5.15 pm</p>	<p>PANEL 5: THE UKRAINE WAR AND FUTURE IMPLICATIONS FOR EAST ASIA</p> <p><u>Moderator</u></p> <p>Dr Pascal Vennesson <i>Senior Fellow and Head of Research S. Rajaratnam School of International Studies Nanyang Technological University, Singapore</i></p> <p><u>Speakers</u></p> <p>Dr Tam-Sang Huynh <i>Lecturer, Faculty of International Relations University of Social Sciences and Humanities Vietnam National University-Ho Chi Minh City</i></p> <p>Dr Brandon Valeriano <i>Bren Chair of Military Innovation Marine Corps University</i></p> <p>Dr Ryo Hinata-Yamaguchi (Virtual Presentation) <i>Project Assistant Professor Research Center for Advanced Science and Technology University of Tokyo</i></p>
<p>5.15 – 5.30 pm</p>	<p>CLOSING REMARKS</p> <p>Dr Michael Raska <i>Coordinator, Military Transformations Programme Institute of Defence and Strategic Studies S. Rajaratnam School of International Studies Nanyang Technological University, Singapore</i></p>
<p>5.30 pm</p>	<p>End of Workshop</p>

About the Military Transformations Programme

The Military Transformations Programme (MTP) was established in 2003. The MTP aims to develop an indigenous policy-relevant and scholarly expertise on emerging military innovation issues such as how novel technologies are affecting military capabilities and warfighting concepts, the Fourth Industrial Revolution (4IR) as a “transformative core” for future militaries – particularly for Indo-Pacific militaries and superpowers – and the impact of such innovations on regional military balances and long-term military-strategic competitions.

Since 2018, the MTP is focusing its research agenda on:

Emerging Technologies: the impact of the 4IR on the development of new types of armaments and other military equipment that may add new capabilities and advantages to militaries over the longer term (i.e., out to 2040). These innovations include advances in AI, autonomous systems, quantum computing, among others, as well as their strategic and operational interactions.

Competitive Strategies: The long-range strategic competition between great powers shapes the direction and character of future military competitions in the Indo-Pacific Region. The MTP research projects aim to provide an on-going assessment of the relative strengths and weaknesses of competitors and suggest sources of competitive advantage such as the maturation and spread of asymmetric anti-access/area-denial capabilities, the proliferation of weapons of mass destruction and disruption, future warfighting strategies and concepts, and their strategic implications for East Asia.

About the Institute of Defence and Strategic Studies (IDSS)

The S. Rajaratnam School of International Studies (RSIS) is a global think tank and professional graduate school of international affairs at the Nanyang Technological University, Singapore. An autonomous school, RSIS' mission is to be a leading research and graduate teaching institution in strategic and international affairs in the Asia Pacific. With the core functions of research, graduate education, and networking, it produces research on Asia Pacific Security, Multilateralism and Regionalism, Conflict Studies, Non-traditional Security, Cybersecurity, Maritime Security and Terrorism Studies.



IDSS comprises nine research programmes, namely: China, Indonesia, Malaysia, Maritime Security, Military Studies, Military Transformations, Regional Security Architecture, South Asia, and the United States. For greater synergy, with effect from April 2020, China and the United States are grouped as the Major Powers, Indonesia and Malaysia are clustered as Malaysia-Indonesia, and Emerging Security consists of Military Transformations along with the Humanitarian Assistance and Disaster Relief at the Centre for Non-Traditional Security Studies (NTS Centre). The Military Studies Programme focuses on professional military education for the Singapore Armed Forces.

For more details, please visit www.rsis.edu.sg and www.rsis.edu.sg/research/idss . Join us at our social media channels at www.rsis.edu.sg/rsis-social-media-channels or scan the QR code.



RSiS

S. RAJARATNAM
SCHOOL OF
INTERNATIONAL
STUDIES

Nanyang Technological University, Singapore

Nanyang Technological University, Singapore

Block S4, Level B3, 50 Nanyang Avenue, Singapore 639798

Tel: +65 6790 6982 | Fax: +65 6794 0617 | www.rsis.edu.sg