

THE ROLE OF ARTIFICIAL INTELLIGENCE IN
ENHANCING MARITIME SECURITY OF PAKISTAN
WITHIN THE FRAMEWORK OF INTERNATIONAL LAW



Submitted by
MUHAMMAD OWAIS
01-278221-006

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Supervised by
DR. SADAQUT ALI

(BAHRIA UNIVERSITY LAW SCHOOL, ISLAMABAD)

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CERTIFICATE OF APPROVAL FOR EXAMINATION

Scholar's Name: Muhammad Owais

Registration No.: 01-278221-006

Program of Study: LL.M. (International and Maritime Laws)

Thesis Title: THE ROLE OF ARTIFICIAL INTELLIGENCE IN ENHANCING
MARITIME SECURITY OF PAKISTAN WITHIN THE FRAMEWORK OF
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Bahria School of Law

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DEDICATION

This thesis is dedicated to my family especially my parents, teachers and friends for their endless love, support, and encouragement.

I humbly dedicate this work to every individual who has made sacrifices and contributed to the maritime security of Pakistan.

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ABSTRACT

The aim of present study is to determine the role of ‘Artificial Intelligence’ in enhancing maritime Security and countering threats. Pakistan is a developing country and is facing multiple challenges and lacks legislation on emerging technologies like Artificial Intelligence. This research investigates the ability of Artificial Intelligence (AI) to bolster Pakistan's maritime safety within the bounds of global law. It explores how AI can improve port safety, counter-piracy efforts, and combat unlawful fishing. The evaluation examines AI's contribution to advancement of maritime dominance, automatic surveillance, and law enforcement. The research methodology is doctrinal and the methods to evaluate this research are descriptive, explorative, analytical and suggestive. However, the research recognizes considerable technical, ethical, and felony demanding situations, together with information limitations, balancing protection with privacy. The examiner emphasizes updated legislation in field of Maritime Security with regard to AI and novel technologies. Finally, it proposes pointers for prioritizing excessive-impact AI applications, infrastructure and teamwork improvement, and fostering public interest in AI for Pakistan's maritime security. The finding regarding this is that Pakistan has not yet adopted adequate legislation on AI. While recommending, the researcher has proposed that to meet the prevailing needs Pakistan should use leapfrogging strategy and deploy AI in every walk of life especially in Maritime Security of Pakistan.

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LIST OF ABBREVIATIONS

ABI	Artificial Broad Intelligence
ACCUs	Air Cargo Control Units
AGI	Artificial General Intelligence
AI	Artificial Intelligence
AIS	Automatic Identification System
ANF	Anti Narcotics Force
ANI	Artificial Narrow Intelligence
ARF	ASEAN Regional Forum
ASI	Artificial Super Intelligence
AUKUS	Australia, United Kingdom, and United States
BCS	Base Control Station
BIPA	Biometric Information Privacy Act
CARICOM IMPACS	The Caribbean Community Implementation Agency for Crime and Security
CCP	Container Control Programme
CISE	Common Information Sharing Environment
CMI	Comite Maritime International
CoE	Council of Europe
COP	Code Of Practice
CPEC	China- Pakistan Economic Corridor
CTF	Combined Task Force
CUES	Code for Unplanned Encounters at Sea
DARPA	Defense Advanced Research Projects Agency
DCoC	Djibouti Code of Conduct
DEA	Drug Enforcement Agency
DiF	Diversity in Face
DL	Deep Learning
DoD	Department of Defense

EEZs	Exclusive Economic Zones
EFFECTOR	End-to-end Interoperability Framework For Maritime Situational Awareness at Strategic and Tactical Operations
ELUUV	Extra Large Unmanned Underwater Vehicles
EU	European Union
EU AI ACT	European Union Artificial Intelligence ACT
EU NAV FOR MED	European Union Naval Forces For Mediterranean
FBR	Federal Board of Revenue
FIA	Federal Investigation Agency
FON	Freedom of Navigation
FY	Fiscal Year
G-20	The Group of Twenty
GPA	Gwadar Port Authority
HLCP	High Level Committee on Programmes
IBMs	International Business Machines
ICC	International Chamber of Commerce
IMB	International Maritime Bureau
IMO	International Maritime Organization
IMSO	International Mobile Satellite Organization
IORISC	Indian Ocean Region Information Sharing Centre
IoT	Internet of Things
IPMDA	Indo-Pacific partnership for Maritime Domain Awareness
ISPS	International Ship and Port facility Security
ISR	Intelligence, Surveillance, and Reconnaissance
I.T	Information Technology
IUU Fishing	Illegal, Unreported and Unregulated Fishing
KPT	Karachi Port Trust
KSDP	Korea-Singapore Digital Partnership Agreement
LAWS	Lethal Autonomous Weapon Systems
LDUUV	Large Displacement Unmanned Undersea Vehicle
LEAs	Law Enforcement Agencies
MAOC (N)	Maritime Analysis and Operations Centre-Narcotics

MARCOM	Allied Maritime Command
MAROL	Marine Pollution
MARSEW	Maritime Security Workshop
MASS	Maritime Autonomous Surface Ships
MCM	Mine Counter Measures
MDA	Maritime Domain Awareness
MISS	Maritime Information Sharing System
ML	Machine Language
MLOps	Machine Learning Operations
MOD	Ministry of Defence
MOMA	Ministry of Maritime Affairs
MOU	Memorandum of understanding
MPAs	Marine Protected Areas
MRCC	Maritime Rescue Co-ordination Centre
NATO	North Atlantic Treaty Organization
NDAA	National Defense Authorization Act
NIMA	National Institute of Maritime Affairs
OECD	Organization for Economic Cooperation and
Development	
PCG	Pakistan Coast Guards
PCUs	Port Control Units
PECA	Prevention of Electronic Crimes Act
PMSA	Pakistan Maritime Security Agency
PN	Pakistan Navy
PNSC	Pakistan National Shipping Corporation
PQA	Port Qasim Authority
QSD	Quadrilateral Security Dialogue
R&D	Research and Development
RAN	Royal Australian Navy
RAS-AI	Robotics, Autonomous Systems and Artificial Intelligence
ReCAAP	Regional Co-operation Agreement on Combating Piracy and Armed Robbery against Ships in Asia
RFID	Radio Frequency Identification
RTOs	Real Time Operation Systems

SAR	Search And Rescue
SLOC	Sea lines of communication
SOLAS	Safety of Life at Sea
STCW	Standards of Training, Certification, and Watchkeeping
SUA	Suppression of Unlawful Acts against the Safety of Marine Navigation
TOC	Transnational Organized Crime
UMSs	Uncrewed Maritime Systems
UNCLOS	United Nations Convention on the Law of the Sea
UNCTAD	United Nations Conference on Trade and Development
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNODC	United Nations Office on Drugs and Crime
UNSC	United Nations Security Council
UNTOC	United Nations Convention against Transnational Organized Crime
UUVs	Unmanned Underwater Vehicles
VTS	Vessel Traffic Services
WEF	World Economic Forum
WCO	World Custom Organization