AI-Driven Early Warning System for Zoonotic Disease Outbreaks

Current State:

- AI is being actively researched for early detection and prediction of zoonotic diseases.
- Existing efforts focus on analyzing physiological data, contact tracing, and surveillance.
- There's a recognized need for integrated, real-time systems that fuse multi-source data (e.g., veterinary records, wildlife sensors, social media).
- Some initiatives like AMPLYFI's Zoonotic Early Warning System and Senegal's community-based surveillance are emerging.
- Research highlights the potential of AI in epidemiology but notes a lack of integrated, real-time systems for zoonotic threats.
- Advancements in remote sensing, environmental biosensors, and geospatial modeling are opening doors for more precise, real-time surveillance.

Gaps/Opportunities for FYP:

- Focus on fusing diverse, real-time data streams (veterinary records, wildlife sensors, social media).
- Develop robust NLP and graph neural networks for pattern identification.
- Emphasize issuing timely and actionable alerts.
- Extend beyond syndromic surveillance to focus on animal-to-human transmission pathways.

AI-Powered Microplastic Detection and Analysis in Water Bodies

Current State:

- AI models (deep learning, CNNs) are being developed to detect and identify microplastics, often using spectral analysis (e.g., Raman spectroscopy) or image segmentation.
- Some research focuses on wastewater, but real-time, in-situ detection in broader aquatic environments (oceans, rivers) is still a challenge.
- There are efforts to integrate AI with sensor networks and autonomous underwater vehicles (AUVs) for continuous monitoring.
- The lack of technologies for rapid and accurate identification and quantification of microplastics in aquatic environments is a recognized gap.

Gaps/Opportunities for FYP:

- Focus on real-time detection and classification using underwater imagery (from AUVs or stationary sensors).
- Develop CNNs specifically trained for diverse microplastic types and environmental conditions.
- Create a live mapping system to visualize pollution hotspots and track movement.
- Emphasize the integration with autonomous systems for practical deployment.

Personalized Mental Health Companion for Astronauts

Current State:

- AI is being explored for mental health support in long-duration space missions, including AI companions and automated psychotherapy.
- Research focuses on continuous monitoring of emotional states and physiological data.

- There's a recognized need for systems that can provide support despite communication delays with Earth.
- Existing efforts include robots like CIMON for mood monitoring and studies on using generative AI for emotional care.
- Concerns exist regarding the ethical implications and effectiveness of generic AI chatbots for mental health.

Gaps/Opportunities for FYP:

- Develop a system that provides *personalized*, *real-time* interventions tailored to individual astronaut needs.
- Focus on NLP to analyze speech and text for subtle cues of stress, anxiety, or depression.
- Integrate tailored interventions (guided meditations, CBT exercises) directly into the system.
- Implement a mechanism to alert mission control for serious concerns, balancing autonomy with oversight.
- Address the challenge of limited data for training highly personalized models in a unique environment.

AI-Driven Urban Heat Island Prediction and Mitigation Planner

Current State:

- AI, particularly machine learning and deep neural networks, is widely used for predicting Urban Heat Island (UHI) effects and mapping urban temperatures using satellite and aerial imagery, and other geospatial data.
- Companies like Google Research are developing Heat Resilience tools to help cities understand and reduce surface temperatures.
- Research is exploring the integration of AI with planning systems for urban climate resilience and the use of generative models for urban climate simulation.
- There are existing tools and frameworks that incorporate AI for UHI detection and characterization, and some studies use ML to inform mitigation strategies.

Gaps/Opportunities for FYP:

- Focus on a *real-time, actionable recommendation system* for mitigation strategies, beyond just prediction.
- Develop a robust simulation component that allows city planners to *simulate the effects of various mitigation strategies* (e.g., tree planting, green roofs, reflective materials) before implementation.
- Integrate diverse data sources (satellite imagery, weather data, urban infrastructure data) into a comprehensive model that can dynamically recommend and simulate.
- Emphasize user-friendly visualization and scenario planning for city planners.

AI-Powered Platform for Verifying and Tracking Corporate Sustainability Claims

Current State:

- AI is being used to simplify ESG reporting, analyze sustainability reports, and detect greenwashing.
- Tools like GreenWatch.ai and platforms from Clarity AI are emerging to assess the authenticity of sustainability claims.
- NLP is a key technology for analyzing corporate reports, news, and social media to identify misleading language.
- AI is also being applied to monitor supply chain sustainability, tracking materials, and ensuring ethical sourcing.

Gaps/Opportunities for FYP:

- Develop a platform that goes beyond analyzing self-reported data and integrates *external, independent data sources* for verification.

- Incorporate satellite imagery and other remote sensing data to *directly monitor a company's environmental impact* (e.g., deforestation, emissions).
- Create a comprehensive "sustainability score" that is transparent and based on a combination of reported data and independent verification.
- Focus on providing actionable insights for both consumers and investors, making the data accessible and easy to understand.

AI-Driven System for Optimizing Crop Yields in Vertical Farms

Current State:

- AI, particularly machine learning, is widely used in vertical farming and hydroponics for optimizing crop growth, predicting yields, and automating environmental controls.
- Sensors and IoT devices are integrated to collect data on lighting, temperature, humidity, nutrient levels, and plant health.
- AI models are used to analyze this data to identify optimal growing conditions, detect diseases/pests, and manage resources efficiently.
- Research shows AI can significantly reduce energy consumption and water usage in indoor agriculture.

Gaps/Opportunities for FYP:

- Focus on a comprehensive system that *integrates real-time sensor data with advanced machine learning models* to dynamically adjust growing conditions for *multiple crop types simultaneously*.
- Develop predictive models that can forecast not only yield but also potential issues (e.g., nutrient deficiencies, disease outbreaks) *before* they become critical.
- Implement an *automated feedback loop* where the AI directly controls environmental parameters (lighting, irrigation, nutrient delivery) based on its analysis.
- Explore the use of computer vision for detailed plant phenotyping and early detection of subtle changes in plant health.

AI-Powered Circular Economy Optimizer for Urban Waste

Current State:

- AI is widely used in urban waste management for route optimization, automated sorting, predictive analytics for waste generation, and identifying material recovery opportunities.
- There are existing AI-powered solutions for waste sorting robots and platforms that leverage AI for efficient waste collection.
- AI is recognized as a key enabler for the circular economy by reducing waste, optimizing resources, and improving sustainability.
- Some initiatives like Google's open-source machine learning model for waste management (CircularNet) are already in place.

Gaps/Opportunities for FYP:

- Focus on a *city-scale optimization tool* that dynamically models waste flows and recommends interventions to maximize recycling and reuse.
- Develop a system that goes beyond current predictive analytics to incorporate *reinforcement learning and agent-based simulation* for real-time, adaptive policy recommendations.
- Emphasize the ability to simulate "what-if" scenarios for different interventions (e.g., new collection points, incentives) to guide urban planners.
- Integrate diverse data sources, including IoT sensors, waste composition data, and citizen behavior patterns.

AI-Enhanced Accessibility Mapping for People with Disabilities

Current State:

- AI is being used to enhance accessibility for people with disabilities, including tools for communication, information access, and navigation.
- Crowdsourcing is a common method for collecting accessibility data, and AI is being explored to automate verification and personalization of this data.
- Projects like AccessNow and Project Sidewalk are using crowdsourcing and AI to map accessibility information.
- Computer vision is used in various accessibility features, such as reading text, identifying objects, and describing scenes for visually impaired individuals.

Gaps/Opportunities for FYP:

- Focus on developing a mobile app that *crowdsources and verifies accessibility data using computer vision and NLP* from user-submitted photos and reviews.
- Emphasize *personalization* of navigation and real-time updates based on individual user needs and preferences.
- Address the challenge of ensuring *reliability and accuracy* of crowdsourced data through AI-driven verification mechanisms.
- Integrate multimodal AI for richer, more reliable data, going beyond basic crowdsourcing apps.

AI-Based Energy Demand Forecasting and Adaptive Management for Off-Grid Communities

Current State:

- AI is widely applied in energy demand forecasting, microgrid optimization, and rural electrification.
- Machine learning models are used to predict energy demand, optimize energy distribution, and manage renewable energy sources in microgrids.
- There are existing AI-powered microgrid solutions aimed at enhancing sustainable energy access and improving energy reliability.
- Research highlights the potential of AI to automate operations and achieve scale in rural electrification, especially in low-data environments.

Gaps/Opportunities for FYP:

- Focus on developing an AI system that not only predicts energy needs but also provides *adaptive, real-time management strategies* for energy storage and distribution in off-grid contexts.
- Address the challenge of *sparse and variable data* in remote, off-grid communities, requiring robust models that can learn from limited information.
- Integrate diverse data sources, including local weather patterns, community events, and unique usage patterns, to create highly localized predictions.
- Emphasize the *optimization of energy storage and distribution* to ensure reliable supply despite unpredictable demand and intermittent renewable sources.
- The novelty lies in the *adaptive management* and *low-data context* rather than just forecasting, which is already well-researched.

Research Papers (Zoonotic Disease Outbreaks):

- Innovative applications of artificial intelligence in zoonotic disease management: https://pmc.ncbi.nlm.nih.gov/articles/PMC11262289/
- Artificial intelligence in early warning systems for infectious disease outbreaks: https://www.frontiersin.org/journals/public-health/articles/10.3389/fpubh.2025.1609615/full
- Advancing early warning and surveillance for zoonotic diseases: https://www.sciencedirect.com/science/article/pii/S167492782300151X
- Artificial Intelligence for Zoonotic Disease Surveillance: https://actascientific.com/ASVS/pdf/ASVS-06-0878.pdf
- AI-based epidemic and pandemic early warning systems: https://journals.sagepub.com/doi/10.1177/14604582241275844
- A Review of Graph Neural Networks in Epidemic Modeling: https://arxiv.org/html/2403.19852v2
- Forecasting West Nile Virus With Graph Neural Networks: https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2023GH000784

Research Papers (Microplastic Detection and Analysis in Water Bodies):

- Artificial intelligence in microplastic detection and pollution control: https://www.sciencedirect.com/science/article/abs/pii/S0013935124017171
- Advances in machine learning for the detection and characterization of microplastics: https://www.frontiersin.org/journals/environmental-science/articles/10.3389/fenvs.2025.1573579/full
- Real-Time Detection of Microplastics Using an AI Camera: https://www.mdpi.com/1424-8220/24/13/4394
- AI-Vision Based Real-Time Underwater Microplastics Detection: https://www.researchgate.net/publication/381705738_AI-Vision_Based_Real-Time_Underwater_Microplastics_Detection
- Microplastic Identification Using AI-Driven Image Segmentation and Classification: https://arxiv.org/html/2410.19604v1
- Deep learning based approach for automated characterization of large marine microplastics: https://www.sciencedirect.com/science/article/abs/pii/S0141113622002744
- A Handy Open-Source Application Based on Computer Vision and Machine Learning for Microplastic Detection: https://www.mdpi.com/2073-4441/13/15/2104

Research Papers (AI-Powered Personalized Mental Health Companion for Extreme Environments):

- Supporting the Mind in Space: Psychological Tools for Long-Duration Spaceflight: https://pmc.ncbi.nlm.nih.gov/articles/PMC11499714/
- Automated Psychotherapy in a Spaceflight Environment: https://www.i-jmr.org/2024/1/e58803
- Off-World Mental Health: Considerations for the Design of Well-Being Supportive Digital Technologies for Spaceflight: https://formative.jmir.org/2023/1/e37784
- Digital mental health support in space: https://osf.io/preprints/psyarxiv/gvhs2/download
- New frontiers for well-being in Antarctica and isolated spaces: https://news.ucsb.edu/2025/021854/new-frontiers-well-being-antarctica-and-isolated-spaces
- Virtual reality and artificial intelligence as psychological countermeasures for long-duration space missions: https://www.sciencedirect.com/science/article/pii/S0094576525002024
- Deep space missions will test astronauts' mental health. Could AI companions help?: https://www.space.com/astronauts-artificial-intelligence-companions-deep-space-missions
- Multimodal Machine Learning For Mental Health Disorder Detection: https://quantumzeitgeist.com/multimodal-machine-learning-for-mental-health-disorder-detection-enhancing-accuracy-accessibility-and-personalization/

Research Papers (AI-Driven Urban Heat Island Prediction and Mitigation Planner):

- Artificial intelligence for predicting urban heat island effect and enhancing urban sustainability: https://www.sciencedirect.com/science/article/pii/S221209552400172X
- Leveraging urban AI for high-resolution urban heat mapping: https://www.researchgate.net/publication/391143872_Leveraging_urban_AI_for_high-resolution_urban_heat_mapping_Towards_climate_resilient_cities
- Precise mitigation strategies for urban heat island effect in Hong Kong: https://www.sciencedirect.com/science/article/pii/S2210670725002264
- Urban Simulation + Generative AI: https://medium.com/urban-ai/urban-simulation-generative-ai-0ee8086b0260
- Generative AI for Sustainable Urban Development: https://stayrelevant.globant.com/en/technology/engineering/gen-ai-for-sustainable-urban-development/
- Efficient regional environmental risk assessment with generative AI: https://research.google/blog/zooming-in-efficient-regional-environmental-risk-assessment-with-generative-ai/
- AI Driven Climate Adaptation Strategies for Urban Areas: https://prism.sustainability-directory.com/scenario/ai-driven-climate-adaptation-strategies-for-urban-areas/

Research Papers (AI-Driven Personalized Learning for Neurodegenerative Disease Patients):

- How AI is rewiring our approach to neurodegenerative diseases: https://pmc.ncbi.nlm.nih.gov/articles/PMC11303987/
- AI-driven innovations in Alzheimer's disease: Integrating early diagnosis, personalized treatment, and prognostic modelling: https://www.sciencedirect.com/science/article/abs/pii/S1568163724003155
- Knowledge map of artificial intelligence in neurodegenerative diseases: https://www.frontiersin.org/journals/aging-neuroscience/articles/10.3389/fnagi.2025.1586282/full
- Predictive AI model could help forecast neurodegenerative diseases: https://www.nsf.gov/news/predictive-ai-model-could-help-forecast-neurodegenerative
- Machine learning for the prediction of cognitive impairment in older adults: https://pmc.ncbi.nlm.nih.gov/articles/PMC10172509/
- New study uses AI to predict who may benefit from cognitive training to stave off dementia: https://phhp.ufl.edu/2023/04/28/new-study-uses-ai-to-predict-who-may-benefit-from-cognitive-training-to-stave-off-dementia/
- Machine learning for adaptive deep brain stimulation in Parkinson's disease: https://pmc.ncbi.nlm.nih.gov/articles/PMC10576725/
- New technology could be a game changer for people with Parkinson's: https://news.stanford.edu/stories/2025/02/the-research-behind-adaptive-deep-brain-stimulation-for-parkinson-s-disease

Research Papers (AI-Enabled Disaster Response Coordination Platform):

- Explainable artificial intelligence in disaster risk management: https://www.sciencedirect.com/science/article/pii/S2212420923006039
- AI for Disaster Response: Enhancing Early Warning Systems and Recovery Efforts: https://www.researchgate.net/publication/386478374_AI_for_Disaster_Response_Enhancing_Early_Warning_Systems_and_Recovery
- Leveraging Artificial Intelligence for Enhanced Disaster Response Coordination: https://internationaljournalofdisasterriskmanagement.com/Vol1/article/view/145
- Enhancing Emergency Response through Artificial Intelligence in Emergency Call Centers: https://pmc.ncbi.nlm.nih.gov/articles/PMC10475749/

- Automatic priority analysis of emergency response systems using IoT and machine learning: https://www.sciencedirect.com/science/article/pii/S2666691X25000041
- AI-Empowered Multimodal Hierarchical Graph-Based Learning for Comprehensive Disaster Event Classification: https://www.mdpi.com/1999-5903/16/5/161
- Ready for the Next Storm: AI-Enabled Situational Awareness in Disaster Response: https://www.jhuapl.edu/sites/default/files/2022-12/AIEnabledSAinDisasterResponse.pdf
- Putting AI on the Front Lines of Hurricane Preparedness: https://engineering.tamu.edu/news/2025/06/putting-ai-on-the-front-lines-of-hurricane-preparedness.html

Research Papers (AI-Powered Food Authenticity and Safety Verification):

- The Journey of Artificial Intelligence in Food Authentication: https://www.mdpi.com/2304-8158/14/10/1808
- Advances in smart food authentication for enhanced safety and quality: https://www.sciencedirect.com/science/article/abs/pii/S092422442400476X
- Enhanced food authenticity control using machine learning-assisted spectroscopy: https://www.sciencedirect.com/science/article/abs/pii/S0963996924014005
- Artificial Intelligence based techniques for authenticity of food products in Food fraud: https://www.researchgate.net/publication/384824269_Artificial_Intelligence_based_techniques_for_authenticity_of_food_products_
- Machine learning assisted biosensing technology: An emerging trend for food safety: https://www.sciencedirect.com/science/article/pii/S2665927124000054
- Applications of Machine Learning in Food Safety and HACCP Monitoring: https://pmc.ncbi.nlm.nih.gov/articles/PMC11941095/
- Consumer Usability Test of Mobile Food Safety Inquiry Platform Based on Deep Learning: https://www.mdpi.com/2071-1050/16/21/9538
- Recent advances on artificial intelligence-based approaches for food fraud detection: https://www.sciencedirect.com/science/article/abs/pii/S0308814624040895
- Detecting Food Fraud through AI-Powered Data Analysis: https://www.labmanager.com/detecting-food-fraud-through-ai-powered-data-analysis-30680

Research Papers (AI-Assisted Debris Tracking for Space Sustainability):

- Role of AI (Artificial Intelligence) in Space Debris Management: https://www.ijnrd.org/papers/IJNRD2307431.pdf
- Enhanced Space Debris Detection and Monitoring Using a Hybrid Bi-LSTM-CNN and Bayesian Optimization: https://www.researchgate.net/publication/386990623_Enhanced_Space_Debris_Detection_and_Monitoring_Using_a_Hybrid_Bi-LSTM-CNN_and_Bayesian_Optimization
- Mission Impossible? Artificial Intelligence, Space Debris, and the Future of Space Law: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=5112687
- Space-based debris trajectory estimation using vision sensors and machine learning: https://www.sciencedirect.com/science/article/pii/S0094576525000396
- A Machine Learning-Based Approach for Improved Orbit Predictions of Space Debris: https://ieeexplore.ieee.org/document/9076032/
- Precise and Efficient Orbit Prediction in LEO with Machine Learning: https://arxiv.org/abs/2407.11026
- Machine learning in orbit estimation: A survey: https://www.sciencedirect.com/science/article/pii/S0094576524001917
- Predicting the Properties of Resident Space Objects in LEO Using Graph Neural Networks: https://digitalcommons.usu.edu/smallsat/2024/all2024/221/

Research Papers (AI-Driven Personalized Learning for Neurodiverse Conditions):

- Neurodiverse Education and Chatbots as Personalized Learning Tools: https://www.researchgate.net/publication/388476739_Neurodiverse_Education_and_Chatbots_as_Personalized_Learning_Tools_Op
- A Scoping Literature Review of Generative Artificial Intelligence for Neurodivergent Students: https://www.sciencedirect.com/science/article/pii/S2666920X25000773
- Leveraging AI in E-Learning: Personalized Learning and Adaptive Learning Environments for Neurodiverse Learners: https://www.mdpi.com/2079-9292/13/18/3762
- AI-Driven Personalized Education For Neurodiversity: https://ijrpr.com/uploads/V6ISSUE5/IJRPR44605.pdf
- Adaptive Learning for Neurodivergent Students: https://arbisoft.com/blogs/adaptive-learning-for-neurodivergent-students
- The Role of Artificial Intelligence in Shaping Adaptive Learning Environments for Neurodiverse Learners: https://vorecol.com/blogs/blog-the-role-of-artificial-intelligence-in-shaping-adaptive-learning-environments-for-neurodiverse-learners-196139
- A Systematic Review for Artificial Intelligence-driven Assistive Technologies for Children with Neurodevelopmental Disorders: https://www.sciencedirect.com/science/article/pii/S1566253525005147
- Newsletter 287: The Future of Learning - How AI is Transforming Education for Dyslexic and Neurodivergent Students: https://www.dyslexic.ai/p/newsletter-287-the-future-of-learning-how-ai-is-transforming-education-for-dyslexic-and-neurodiverge

Research Papers (Sustainable Urban Farming Optimization in Water-Scarce Regions):

- Artificial Intelligence and IoT for Water Saving in Agriculture: https://www.sciencedirect.com/science/article/pii/S2772375525002412
- AI-driven irrigation systems for sustainable water management: https://www.sciencedirect.com/science/article/pii/S2772375525002151
- AI-driven optimization of agricultural water management for sustainable development: https://www.nature.com/articles/s41598-024-76915-8
- Harnessing the Power of AI for Sustainable Water Consumption: https://www.researchgate.net/publication/379142449_Harnessing_the_Power_of_AI_for_Sustainable_Water_Consumption
- How AI in Farming is Changing the Future of Urban Agriculture: https://aifarming.ca/blogs/how-ai-in-farming-is-changing-the-future-of-urban-agriculture/
- Machine learning-based analysis of nutrient and water uptake in hydroponic systems: https://www.nature.com/articles/s41598-024-74376-7
- Enhancing hydroponic farming with Machine Learning: Growth prediction and nutrient optimization: https://www.sciencedirect.com/science/article/abs/pii/S0952197625012151
- Revolutionizing Indoor Hydroponic Farming: How AI and Machine Learning Are Shaping the Future of Agriculture: https://www.veggroom.com/revolutionizing-indoor-hydroponic-farming-how-ai-and-machine-learning-are-shaping-the-future-of-agriculture/?srsltid=AfmBOopyyHEpdBQXOZzMSCRN6OoqHT_Crq3MgAm2YprJR6TMkTeB8fDO
- Integrating AI for Optimized Vertical Farm Water Use: https://prism.sustainability-directory.com/scenario/integrating-ai-for-optimized-vertical-farm-water-use/
- Vertical farm in Avondale promotes sustainability, technology, water conservation: https://www.aztechcouncil.org/vertical-farm-in-avondale-promotes-sustainability-technology-water-conservation/

Research Papers (AI-Driven Culturally Sensitive Educational Platforms for Indigenous Communities):

- Indigenous peoples and artificial intelligence: A systematic review of the literature: https://journals.sagepub.com/doi/10.1177/20539517251349170

- Systematic Review: AI in Indigenous and Cultural Education—Bridging Knowledge Gaps: https://www.researchgate.net/publication/389434697_Systematic_Review_AI_in_Indigenous_and_Cultural_Education-Bridging_Knowledge_Gaps
- counteracting bias with indigenous epistemologies: https://link.springer.com/article/10.1007/s00146-024-02065-0
- Language, artificial education, and future-making in indigenous language revitalization: https://www.tandfonline.com/doi/full/10.1080/17439884.2023.2278111
- Indigenous language technology in the age of machine learning: https://www.tandfonline.com/doi/full/10.1080/08003831.2024.2410124
- Using Artificial Intelligence to Preserve Indigenous Languages: https://ict.usc.edu/news/essays/using-artificial-intelligence-to-preserve-indigenous-languages/
- Beyond the algorithm: How AI can support Native communities: https://thecirclenews.org/environment/beyond-the-algorithm-how-ai-can-support-native-communities/
- Preserving Indigenous Knowledge Through AI: AIHEC's Purposeful AI Initiative: https://www.linkedin.com/pulse/preserving-indigenous-knowledge-through-ai-aihecs-groundbreaking-ukvwe

Research Papers (AI-Driven Predictive Maintenance for Renewable Energy Infrastructure):

- AI in renewable energy: A review of predictive maintenance and energy optimization: https://ijsra.net/sites/default/files/IJSRA-2024-0112.pdf
- AI-assistance for predictive maintenance of renewable energy systems: https://www.sciencedirect.com/science/article/pii/S0360544221000244
- AI-Driven Predictive Maintenance for Energy Infrastructure: https://ideas.repec.org/a/bjc/journl/v11y2024i9p507-528.html
- AI and Data Analytics for Predictive Maintenance in Solar Power Plants: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=5074755
- A Machine Learning Framework for Predictive Maintenance of Wind Turbines: https://dspace.mit.edu/bitstream/handle/1721.1/129927/1237565618-MIT.pdf?sequence=1&isAllowed=y
- What is Wind Turbine Predictive Maintenance?: https://www.vhive.ai/glossary/wind-turbine-predictive-maintenance/
- Artificial-Intelligence-Based Detection of Defects and Faults in Photovoltaic Systems: https://www.mdpi.com/1996-1073/17/19/4807
- Fault diagnosis of photovoltaic systems using artificial intelligence: https://www.sciencedirect.com/science/article/pii/S2405844023086991
- AI-Based Solar Panel Fault Detection Systems: https://journal.esrgroups.org/jes/article/view/8773

Research Papers (AI-Powered Deep Sea Biodiversity Monitoring and Anomaly Detection):

- Artificial Intelligence in Aquatic Biodiversity Research: A PRISMA-Compliant Systematic Review: https://pmc.ncbi.nlm.nih.gov/articles/PMC12109572/
- Framing Cutting-Edge Integrative Deep-Sea Biodiversity Monitoring: https://www.frontiersin.org/journals/marine-science/articles/10.3389/fmars.2021.797140/full
- The Potential of Low-Tech Tools and Artificial Intelligence for Monitoring Blue Carbon in Greenland's Deep Sea: https://tos.org/oceanography/article/the-potential-of-low-tech-tools-and-artificial-intelligence-for-monitoring-blue-carbon-in-greenlands-deep-sea
- Leveraging Pre-trained Deep Learning for Deep-Sea ROV Biota Classification: https://www.nature.com/articles/s41597-024-03766-3

- A deep learning model for detecting and classifying multiple marine mammal species from passive acoustic monitoring data: https://www.sciencedirect.com/science/article/pii/S1574954124004485
- Advances and applications of machine learning in underwater acoustic signal processing for marine life monitoring: https://link.springer.com/article/10.1007/s44295-023-00005-0
- AI Cracks the Ocean’ s Acoustic Code to Reveal Hidden Marine Life: https://scitechdaily.com/ai-cracks-the-oceans-acoustic-code-to-reveal-hidden-marine-life/
- Discovering unknowns: Context-enhanced anomaly detection for unstructured underwater environments: https://www.sciencedirect.com/science/article/abs/pii/S0031320322003417
- Anomaly Detection for In Situ Marine Plankton Images: https://openaccess.thecvf.com/content/ICCV2021W/OceanVision/html/Pu_Anomaly_Detection_for_In_Situ_Marine_Plankton_Images_
- AI To Monitor Marine Biodiversity in Motion: https://econcretetech.com/blogcat/ai-to-monitor-marine-biodiversity-in-motion/
- AI in Marine Monitoring and Biodiversity Assessment: https://www.oceansciencetechnology.com/feature/ai-in-marine-monitoring-and-biodiversity-assessment/

Research Papers (AI-Driven Misinformation Detection and Education for Low-Literacy Populations):

- Misinformation and Literacies in the Era of Generative Artificial Intelligence: A Brief Overview and a Call for Future Research: https://journals.sagepub.com/doi/10.1177/27523543241240285
- Misinformation reloaded? Fears about the impact of generative AI on misinformation are overblown: https://misinforeview.hks.harvard.edu/article/misinformation-reloaded-fears-about-the-impact-of-generative-ai-on-misinformation-are-overblown/
- Specific media literacy tips improve AI-generated visual misinformation detection: https://cognitiveresearchjournal.springeropen.com/articles/10.1186/s41235-025-00648-z
- Leveraging Artificial Intelligence To Enhance Media Literacy And Combat Misinformation: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4991258
- Modality Interactive Mixture-of-Experts for Fake News Detection: https://arxiv.org/abs/2501.12431
- Is Less Really More? Fake News Detection with Limited Information: https://dl.acm.org/doi/10.1145/3748239.3748243
- AI Literacy for Underserved Students: Leveraging Cultural Capital for Equitable AI Education: https://dl.acm.org/doi/10.1145/3706598.3713173
- Bridging the Education Divide: How AI Can Support Underserved Communities: https://techtotherescue.org/blog/2024/11/19/bridging-the-education-divide-how-ai-can-support-underserved-communities/
- Countering AI-powered disinformation through national regulation: https://www.frontiersin.org/journals/artificial-intelligence/articles/10.3389/frai.2024.1474034/full
- How AI can also be used to combat online disinformation: https://www.weforum.org/stories/2024/06/ai-combat-online-misinformation-disinformation/

Research Papers (AI-Powered Extraterrestrial Resource Mapping and Utilization Planner):

- Colonization Beyond Earth: Comparative Analysis of Human and AI Needs, Resource Requirements, and Likely Activities on Extraterrest https://www.researchgate.net/publication/387262704_Colonization_Beyond_Earth_Comparative_Analysis_of_Human_and_AI_Needs
- Unlocking the future of space resource management through artificial intelligence and satellite remote sensing: https://www.sciencedirect.com/science/article/abs/pii/S0301420724003143
- Space Mining: Harvesting Resources Beyond Earth with AI: https://medium.com/@jeyadev_needhi/space-mining-harvesting-resources-beyond-earth-with-ai-f46a038fee99

- Asteroid Exploration: AI in Mining and Resource Extraction: https://www.linkedin.com/pulse/asteroid-exploration-ai-mining-resource-extraction--nvpif
- AI-Based Space Mining for Precious Resources: https://ai.thestempedia.com/community-project/ai-based-space-mining-for-precious-resources/
- Lunarlab | AI for Lunar Exploration: https://lunarlab.ai/
- NASA Developing AI to Steer Using Landmarks – On the Moon: https://www.nasa.gov/technology/goddard-tech/ai-nav-using-landmarks-on-the-moon/
- No Humans, No Problem! NASA’ s AI-Powered Rovers Set to Autonomously Map the Moon: https://opentools.ai/news/no-humans-no-problem-nasas-ai-powered-rovers-set-to-autonomously-map-the-moon