PORTFOLIO - CIVIL INFRASTRUCTURE AI

Dong Ho Kang, Ph.D.

AI Engineer - Autonomous Inspection & Structural Health Monitoring

Eight years turning structural-health-monitoring research into field-deployed AI systems - crack segmentation, autonomous UAV inspection, and industrial defect detection running on real infrastructure, not just in a paper. 1,600+ citations, 7 SCI(E) journal papers, 1 US patent, and production AI shipped at Ericsson and a YC-backed startup.

1,600+	7	1	8
SCHOLAR CITATIONS	SCI(E) PAPERS	US PATENT	YEARS, RESEARCH TO PRODUCTION

Targeting: Infrastructure / Smart-City / Sovereign AI Roles - US & Gulf (UAE, Qatar, Saudi Arabia)

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01 · VOYAGE

CAREER NARRATIVE

Henry's path runs in a straight line from **civil infrastructure research** to **production AI**: a Ph.D. spent flying autonomous drones over real bridges and power infrastructure to detect cracks and damage, then eight years applying the same rigor - data curation, model training, evaluation, deployment - to government inspection programs and commercial generative AI. The throughline is the same in every era: take a physical-world sensing problem, ship a model that works outside the lab, and prove it against a real target with no second chance.

TIMELINE

2017–22 — **Ph.D. - Autonomous Drones & Vision, University of Manitoba**
Crack-segmentation and UAV structural-health-monitoring research that became reference points in the field. Thesis: AI and Robotics for Infrastructure Management.
485 · 477 · 330 citations on flagship papers · US Patent 12,315,238

2022–23 — **AI Team Lead - Qii.ai (Toronto, Canada)**
Research moved out of the lab and onto real infrastructure: 6 government and defense AI missions, multi-step CV reasoning, auto-labeling, multimodal sensor fusion.
Won the Royal Canadian Navy Fleet Inspection Sandbox - live drone + AI inspection on a real RCN target

2023–24 — **Senior AI Scientist - Ericsson (Toronto, Canada)**
Led a 10-person AI team shipping generative video, deepfake detection, super-resolution, and rigorous eval frameworks (LLM-as-judge + automatic + human review) into production pipelines.

2024–present — **Founder · Lecturer · Applied AI - UStechlab / GetPickle (YC S25) / Kookmin University**
CTO at UStechlab; architected the AI for GetPickle (YC S25, $700K seed); leads SLM deployment at Kookmin (14s → 3s inference, 79% latency reduction); teaches applied ML/LLM deployment to 15 graduate students across 13 active research topics.

02 · RESEARCH

PUBLISHED WORK - STRUCTURAL HEALTH MONITORING & INFRASTRUCTURE AI

1,600+	7	1	13
SCHOLAR CITATIONS	SCI(E) JOURNAL PAPERS	US PATENT (12,315,238)	ACTIVE RESEARCH TOPICS, 2026

TITLE	VENUE & YEAR	CITATIONS
Hybrid pixel-level concrete crack segmentation and quantification across complex backgrounds using deep learning	Automation in Construction, 2020	**485**
Autonomous UAVs for structural health monitoring using deep learning and an ultrasonic beacon system with geo-tagging	Computer-Aided Civil and Infrastructure Engineering, 2018	**477**
Efficient attention-based deep encoder and decoder for automatic crack segmentation	Structural Health Monitoring, 2022	**330**
Real-time multiple damage mapping using autonomous UAV and deep faster region-based neural networks for GPS-denied structures	Automation in Construction, 2021	**190**
Deep learning–based obstacle-avoiding autonomous UAVs with fiducial marker–based localization for structural health monitoring	Structural Health Monitoring, 2023	**81**
Damage detection with an autonomous UAV using deep learning	Sensors and Smart Structures Technologies, 2018	**23**
Hybrid concrete crack segmentation and quantification across complex backgrounds without a large training dataset	Data Science in Engineering, 2021	**10**
Computer-implemented arrangements for processing image having article of interest	US Patent 12,315,238, 2025	—
Pocket RAG: on-device RAG for first-aid guidance in offline mobile environments	arXiv preprint, 2026	**1**
Emergency landing zone selecting model for UAV	Int'l Journal of Control and Automation, 2016	**2**

03 · FOOTAGE

FIELD-DEPLOYED SYSTEMS

Selected AI systems shipped on real infrastructure in the field - not lab demos.



UAV · LIVE TRACKING · QII.AI

Autonomous insulator wash run

A drone locks onto live power-line insulators and pressure-washes them in real time - the vision + tracking stack shipped cloud-to-embedded on real transmission infrastructure.



SEGMENTATION · FIELD DEPLOY · QII.AI

Interactive defect segmentation

Click-to-segment insulator inspection on real field footage - the attention encoder–decoder research line (330 citations), taken out of the lab and into a working inspection tool.



INDUSTRIAL CV · PRODUCTION

Tire X-ray damage detection

Defect detection running on a live tire X-ray inspection line - non-destructive evaluation (NDE) deployed as a production operations tool, not a paper demo.

04 · DEBRIEF

CURRENT WORK

UStechlab - Chief Technology Officer
Sets technical direction for applied AI research on fine-tuning and compressing LLMs for consumer applications under real compute, memory, and latency constraints.

GetPickle (YC S25) - Technical Advisor
Architected a real-time conversational AI avatar pipeline with sub-0.5ms response scheduling; team raised a $700K seed following the AI architecture work.

Kookmin University (Irvine) - AI Lecturer / Applied LLM Researcher
Fine-tunes and deploys SLMs for production mobile applications (14s → 3s inference, 79% latency reduction); teaches applied ML and production LLM deployment to graduate students across 13 active research topics.

FIT FOR INFRASTRUCTURE & SOVEREIGN AI PROGRAMS

Henry's rare combination - structural-health-monitoring research, drone/defense-grade CV systems, and foundation-model fine-tuning at production scale - maps directly onto infrastructure, smart-city, and sovereign-AI priorities across the Gulf: non-destructive evaluation of physical assets, autonomous inspection at scale, and the eval/latency discipline needed to run AI in high-stakes, real-world deployments. Open to relocation for the right infrastructure-AI or applied-research role.

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