

DHWANIL CHAUHAN

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Publications & Research

Visual Geometry Grounded Novel-View Acoustic Synthesis

CVPR Workshop 2026

- First unified framework for novel-view acoustic synthesis bypassing explicit 3D reconstruction via feed-forward visual geometry grounding; outperforms prior baselines on RWAVS and Replay-NVAS benchmarks.
- *Contribution:* Designed the VGGT output representation and formulated the query/key structure of the Geometry-Grounded Acoustic Decoder (GGAD) cross-attention mechanism.

Development of Trialing Image Detection for a Melt Shop Safety Tool

AISTech 2026

- Multi-camera perception system for dynamic safety zone reconfiguration in active industrial environments; adaptive zone boundaries computed in real time from multi-view spatial reasoning.
- *Contribution:* Developed the rule-based spatial reasoning engine fusing four camera perspectives to redefine safety boundaries from outermost detected blocker positions.

Artificial Intelligence-Assisted Accident Investigation: Improving Safety Reporting with LLMs

AISTech 2025

- Conversational AI system for industrial safety incident management; context-aware dialogue with dynamic action sequencing in live steel manufacturing environments.
- *Contribution:* Designed and implemented the conversational AI backend, monolithic Django pipeline handling context retention, dialogue state, and action sequencing.

VLM Robustness Benchmark Under Simultaneous Multimodal Degradation

Targeting IEEE TPAMI / IJCV

- Systematic evaluation of 20 VLMs under controlled simultaneous visual and linguistic corruption; novel text corruption module and structured evaluation pipeline.

AI-Assisted Accident Investigation V2: Multi-Agent Architecture Benchmark

Targeting ACL

- Evolution from monolithic pipeline to modular multi-agent system; on-premise LLM evaluation benchmark for industrial agentic deployment.

Research Experience

Graduate Research Assistant - CIVS

Aug. 2024 – Present

Center for Innovation Through Visualization and Simulation, Purdue University Northwest

Hammond, IN

- Manual incident reporting in steel manufacturing produces inconsistent, incomplete records under post-incident time pressure; built a conversational AI system guiding supervisors through structured dialogue to capture incident classification, risk assessment, root cause, and corrective actions in real time. (*AISTech 2025; V2 targeting ACL*)
- Static safety zone boundaries cannot track real-time equipment movement in active melt shop floors, creating blind spots preceding near-miss and injury incidents; developed a multi-camera spatial reasoning system dynamically redefining zone boundaries from live equipment positions to enable proactive hazard detection. (*AISTech 2026*)
- Industrial safety simulation demands spatially accurate audio for genuine situational awareness; contributed core components of a feed-forward framework synthesizing geometrically accurate binaural audio from standard video, eliminating costly per-scene 3D reconstruction. (*CVPR Workshop 2026*)

AI Research Analyst

Jul. 2025 – Dec. 2025

Untapped Ventures

Remote

- Designed three investment-decision LLM agents (Pre-Seed, Seed, Studio) that ingest heterogeneous pitch materials, PDFs, PPTs, founder submissions, and generate structured invest/pass recommendations against a formalized multi-stage evaluation rubric.
- Built an automated screening pipeline with multi-source retrieval and LLM-based scoring (1–100 scale); three-tier confidence routing triggered autonomous outreach above 67, analyst review between 40–67, and batched triage below 40.
- Iterated through prompt engineering cycles to improve structured output reliability and context retention across long heterogeneous documents, developing applied intuitions around LLM failure modes in multi-step reasoning pipelines.

Education

Purdue University Northwest

Aug. 2024 – Dec 2026

Master of Science in Computer Science | GPA: 3.84

Hammond, IN

Academic Service

Peer Reviewer : [Neural Computing and Applications](#) · [International Journal of Computing and Digital Systems](#)

Technical Skills

Research Areas: Multimodal AI · Vision-Language Models · Audio-Visual Learning · Multi-Agent Systems · Industrial AI Safety · Agentic Pipelines · Robustness Evaluation

Frameworks & Tools: PyTorch · Hugging Face Transformers · LangChain · LangGraph · OpenCV · VGGT

Languages: Python · SQL · JavaScript · \LaTeX