Yufeng Huang

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Research Profile

Game AI engineer with 8+ years of industry experience across major studios (Tencent, ByteDance, NetEase), spanning the full spectrum of AI in games — from classical game-playing AI (behavior trees, finite-state machines, utility AI, RL) to generative AI for game assets (concept art, UI icons, character animation), to LLM-driven autonomous NPCs and AI-assisted content-authoring tools.

My work sits at the intersection of **AI for games, intelligent interactive agents, and human–AI co-creation**. Beyond building agents that *play* and *inhabit* games, I have led the development of AI-assisted tools that help people create games, including systems for generating narrative, dialogue, quests, levels, and even end-to-end production tooling. This first-hand experience of the creative production pipeline has shaped my central research interest: **how AI agents can act as collaborative partners that augment, rather than replace, human designers throughout the creation process.**

Research Interests

Human–AI co-creation • Interactive and autonomous virtual agents • Multi-agent systems for creative and interactive tasks • Game-playing AI and generative AI

Education

Huazhong University of Science and Technology **Sep 2014 – Jun 2017**

M.S. in Pattern Recognition and Intelligent Systems • GPA: 3.75/4.0 *Wuhan, China*

- Thesis: *CNN-based Visual Place Recognition in Changing Environments*
- Relevant coursework: Machine Learning and Data Mining, Pattern Recognition, Computer Vision, Theory of Matrices, Stochastic Processes

Huazhong University of Science and Technology **Sep 2010 – Jun 2014**

B.E. in Measurement & Control Technology and Instrumentation • GPA: 3.73/4.0 *Wuhan, China*

- Relevant coursework: C Programming, Data Structures, Computer Networks, Calculus, Linear Algebra, Probability Theory

Professional Experience

Tencent — SGRA Studio **Jul 2024 – Present**

Tools Engineering Team Lead & Game AI Lead *Guangzhou, China*

Role Overview: Lead studio-level tools engineering and game AI at SGRA Studio, focusing on NPC behavior modeling, LLM-driven agents, and AI-assisted content creation.

- **Controllable and scalable LLM-driven agents** (*Animula Nook*): Investigated the trade-off between behavioral controllability and personality-driven expressiveness in autonomous NPC agents under constrained computational budgets. Designed a hybrid neuro-symbolic architecture in which symbolic controllers (behavior trees, finite-state machines, utility AI) ground and constrain LLM-based modules within a sense–plan–act loop. Agents exhibit configurable personalities, persistent conversational memory, and autonomous daily routines. Behavioral level-of-detail and compute scheduling enable dozens of fully autonomous agents per scene and millions of agent instances ($\sim$10$\times$ the player population) at server scale.
- **Human–AI co-creative authoring**: Led the development of 10+ mixed-initiative AI authoring tools for game content, covering narrative generation, procedural level generation, and synthesis of structured gameplay specifications (e.g., behavior trees and visual scripting graphs). Investigated human–AI collaborative workflows at production scale, balancing generative automation with authorial control through human-in-the-loop iterative refinement and substantially reducing content creation time.
- **Agentic tool and game generation**: Developed an experimental pipeline in which an LLM agent autonomously produces production tools end-to-end (UI design, implementation, and automated testing); currently investigating multi-agent approaches to general-purpose game prototyping.
- **Systems and infrastructure**: Contributed to core gameplay systems (animation, NPCs, dialogue, quests, combat, chat) and designed the globally distributed server architecture of *Animula Nook*, supporting 1M+ DAU in a single shared world.

ByteDance — Nuverse **Jun 2021 – Dec 2023 & Feb 2024 – Jul 2024**
Senior Software Engineer *Guangzhou, China*

Role Overview: Developed game AI systems and designer-facing authoring tools across multiple projects, addressing two sides of human–agent interaction: how players experience autonomous agents, and how non-programmer designers specify their behavior.

- **End-user authoring tools**: Owned the end-to-end design, development, and iteration of a suite of visual authoring tools (visual scripting, behavior trees, narratives, quests, and dialogue) that enable non-programmer designers to specify agent behavior and game logic; continuously refined their interaction design through feedback cycles with designers as end users.
- **Player-adaptive adversarial agents**: Designed multi-phase Souls-like boss AI with hierarchical behavior trees and state machines, incorporating lightweight player modeling that tracks behavioral patterns and performance to counter-adapt tactics and dynamically adjust difficulty.
- **Believable agents at scale** (*Dragonheir: Silent Gods*): Designed an event-driven NPC architecture sustaining 1,000+ concurrent agents per scene for authored narrative performances in a dialogue-intensive CRPG.
- **Context-aware ambient agents**: Developed a utility-based decision framework producing believable daily routines and environmental responses for NPCs in an open-world ARPG.
- **Tactical decision-making** (*Dragonheir: Silent Gods*): Developed auto-battler combat AI with behavior trees and finite-state machines; conducted exploratory reinforcement learning experiments on lineup composition and unit positioning.
- **Generative AI for content production**: Explored generative AI across the art and animation pipeline: concept art and UI icon generation with diffusion models, text-to-motion synthesis, and video-based motion capture, systematically evaluating quality–efficiency trade-offs for production deployment.

NetEase Games **Jul 2017 – Jul 2019 & Apr 2020 – Jun 2021**
Software Engineer *Guangzhou, China*

Role Overview: Developed cooperative and competitive game agents and player-facing interaction systems for an open-world MMORPG and a MOBA title.

- **Cooperative companion agents**: Developed companion AI combining behavior trees and utility AI that coordinates with the player in combat, inferring player intent and adapting its role (e.g., protecting, supporting, or focusing targets) to the player's state.
- **Human-like MOBA agents** (*Onmyoji Arena*): Contributed to utility-based bots deployed in beginner matches, human–AI mixed teams, and disconnection takeover; participated in exploratory research on reinforcement-learning-based PvP agents targeting human-like behavior rather than win rate.
- **Player-facing interaction systems**: Implemented character control and camera systems to enhance player interaction experience in an open-world MMORPG, and gameplay systems for *Onmyoji Arena* (hero skills, in-game events, battle pass).

Publications

1. **Y. Huang** and J. Liu. "CNN-based visual place recognition method." *Computer & Digital Engineering*, 2018(6). Link
2. **Y. Huang**, Y. Liu, and J. Liu. "New bionic navigation algorithm based on the visual navigation mechanism of bees." *Proceedings of SPIE*, 9522, pp. 235–240, 2015. DOI: 10.1117/12.2179840
3. L. Wang, **Y. Huang**, and J. Liu. "Bionic navigation algorithm based on contrast entropy flow." *China Sciencepaper*, 2015(10), pp. 967–970. Link

Honors & Awards

- **Second-Class Graduate Academic Scholarship**, Huazhong University of Science and Technology, 2015–2016 and 2016–2017
- **Meritorious Winner**, Mathematical Contest in Modeling (MCM), COMAP, 2013

Technical Skills

Programming: Python, C/C++, C#
AI and LLM Frameworks: PyTorch, Hugging Face, LangChain, vLLM, MCP
Software and Infrastructure: FastAPI, Docker, Linux, MongoDB, Redis
Game Engines: Unity, Unreal Engine, Godot

Languages

English: TOEFL iBT 5.0/6.0 (Sep 2026)
Chinese: Native (Mandarin)