Yiwei Gong

Co-Founder · Solution Architect

Shanghai China, +86 136 0689 5149 | Singapore, +65 9372 5824

✉ imwithye@gmail.com | 🎂 Feb, 1994 | ⌨ github.com/imwithye | 🔗 linkedin.com/in/yiwei-gong

"The future is now."

Personal Profile

Yiwei is a highly-experienced senior co-founder with expertise in various technologies like computer graphics, artificial intelligence, software development, and cloud infrastructure. He founded two successful companies in Singapore and Hangzhou, serving notable clients such as Singapore government, Hong Kong government, China Communications Construction Group, Pinming Group, and AECOM Group. Yiwei has exceptional business development and company management skills, and his expertise has been recognized by media outlets like Straits Times and Zhejiang TV. He holds Bachelor's and Master's degrees in Computer Science and Artificial Intelligence from Nanyang Technological University and National University of Singapore, respectively.

Education

National University of Singapore   *Singapore*

Master in Artificial Intelligence   *Aug 2021 - May 2023*
- MComp Study Award Scholarship
- **Major:** 3D Computer Vision, Computer Graphics, Natural Language Processing, Deep Learning

Nanyang Technological University   *Singapore*

Major in Computer Science and minor in Chinese   *Aug 2012 - May 2016*
- Graduated with Honours Degree, Second Upper
- SM2 Full Scholarship
- **Competition:** 1. Second place in the Facebook Asia Hackathon. 2. Represented NTU in the Student High-Performance Computing (HPC) Competition.
- **Internship:** 1. Use Grafana to monitor massive transaction data and implements distributed log storage and analysis using CouchDB at PayPal. 2. Serve as a researcher and develops graph search algorithms based on CUDA acceleration at National University of Singapore.

Work Experience

VRcollab Pte. Ltd.   *Singapore*

Co-founder, Board Director, CTO   *Dec 2016 - Jan 2023*
- **About:** As a co-founder and technical lead at VRcollab, Yiwei is responsible for leading the planning, research, development, and maintenance of the company's platform. He also manages the technical specifications and provides support to the project team, while communicating with relevant managers and stakeholders. VRcollab's cutting-edge platform enables seamless collaboration among architects, engineers, planners, and consultants, and has been trusted by clients such as AECOM, Sembcorp A&E, BCA, Surbana Jurong, HDB, NUS, BECA, GreatEarth, and more. Yiwei also cultivates relationships with customers and investors, providing technical expertise and resolving any technical queries that may arise.
  Tech Stacks： Yiwei's responsibilities include designing the k8s runtime environment, developing microservices in Golang, C++, and C#, and ensuring their seamless integration. He also created the Mesh conversion and optimization pipeline, which allows for the one-click conversion of BIM models into a custom binary format, and developed a model viewer based on JavaScript and WebGL. Yiwei utilized advanced rendering technologies such as hierarchical Z-buffering, spatial octree, and progressive rendering to efficiently render large-scale BIM models on the web. In addition, he collaborated with graphics engineers to develop a progressive global illumination rendering algorithm using Unity.

- **Management achievements:** Yiwei manages offices in Singapore and China with more than 30 employees. Successfully raised S$1 million from 4 investors within two years. Has reached cooperation with more than 100 AEC companies and more than 2,000 professionals.
- **Management skills:** Corporate management, business development, investor relations management.

- **Technical achievements:** Design and develop the entire system architecture, real-time rendering pipeline, data processing pipeline, model conversion and optimization algorithms, and web viewer for large 3D models.
- **Technical skills:** k8s, Docker, Linux, computer graphics, computer vision, deep learning, system architecture, and large-scale system development.

Changyi Construction Technology Co., Ltd.

Hangzhou

Co-Founder

Dec 2020 - Jan 2023

- **About:** Changyi is a subsidiary of VRcollab Pte. Ltd., a technology and research center. Changyi's well-known customers include China Communications Construction Group Co., Ltd., Pinming Technology, and other companies. Yiwei is responsible for building the team from scratch, recruiting team members, and managing the company's operations. The company participated in the digital delivery of Changtai Suota Bridge, the world's tallest bridge tower, as well as the digital delivery of TollGroup Group, and also participated in the smart contract development and distribution of LiHo milk tea NFT in Singapore.
- **Management achievements:** Software and solution provider for state-owned and listed companies in China. Manage more than 10 employees, including senior developers from Honor of Kings.

NUS Database Lab

Singapore

Researcher

Aug 2014 - Jan 2016

- **About:** Working as a researcher in the Database Laboratory of the National University of Singapore, researching the K-mean algorithm based on CUDA acceleration. The lab received funding from NetEase and Zhejiang University.
- **Technical skills:** CUDA, C++, Linux, Git

Projects

Distributed crawler system

Shanghai

AIO Group Inc.

Feb 2023 - June 2023

- The project requires the design and implementation of a distributed crawler system encompassing various aspects such as creating a scheduler, developing algorithms for text extraction and content rearrangement, integrating a headless browser, load balancing, reverse engineering anti-crawling strategies, and handling website AJAX requests.
- **Technical skills:** Golang, Chrome, Docker, Kubernetes

WebGL progressive rendering system for super large scene

Singapore

VRcollab Pte. Ltd.

Dec 2021 - Dec 2022

- The project is to create a web viewer for BIM models using hierarchical Z-buffer culling, spatial octree, progressive rendering, and the ThreeJS platform. This would enable the smooth rendering of super-large models in web browsers at 60 frames. Additionally, the project also implements Object Picking technology in the screen space, allowing object extraction and measurement without the use of physics engines.
- This project implements a publishing service using Docker, Wine, and Kubernetes for deployment. The entire process automatically completes the uploading, format conversion, Mesh optimization, space segmentation, data processing, etc. of the BIM model.
- **Technical skills:**WebGL, ThreeJS, occlusion culling, octree, spatial acceleration structure, Docker, Wine, Kubernetes

BIM model compliance check tool

Singapore

VRcollab Pte. Ltd.

_2018 - 2020_

- This project implements an automated BIM model compliance checking tool. BIM model compliance check is a quality control and compliance check performed in the development of Building Information Modeling (BIM). The purpose is to ensure that the BIM model complies with industry standards, codes, and regulations, as well as meets the requirements of owners and designers. BIM model compliance checks cover multiple aspects, including model geometry, attribute data, and more. Through inspection, errors in the model can be found and corrected, avoiding problems that may cause property impacts or security threats, and ensuring reasonable collaboration and communication among various participants to improve the quality and reliability of the BIM model.
- Led the team to implement algorithms such as model collision checking, attribute checking, and compliance checking.
- **Technical skills:** Computational Geometry, C++, , Docker, Wine, Kubernetes

BIM model rendering engine based on Unity HDRP

Hangzhou

VRcollab Pte. Ltd.

_2021 - 2022_

- A custom rendering engine developed based on the Unity HDRP pipeline. It can load BIM data in real-time and provide 4K picture and video rendering services. It can simulate weather changes, season changes, and day and night changes in real-time.
- This product has been integrated into the Pinming product ecosystem and has been used by more than 200 customers.
- **Technical Skills:** Unity, Graphics, Raytracing

VR/AR application for building construction simulation in Unity with custom rendering system

Singapore

VRcollab Pte. Ltd.

_2017 - 2022_

- Designed and implemented a custom rendering system in Unity for loading BIM models (Revit, IFC, SketchUp) at 60FPS at runtime, which can be used smoothly in virtual reality or augmented reality, and led the team to develop a progressive global lighting system.
- **Technical Skills:**Unity, ThreeJS, Global Illumination, Ray Tracing

NFT and smart contract development

Singapore

VRcollab Pte. Ltd.

Dec 2022 - Jan 2023

- Designed and implemented a smart contract for NFT publications, allowing users to purchase NFTs on the marketplace using traditional payment systems (Visa, Master, etc.).
- **Technical skills:**Solidity, Smart Contract.

Lucy Programming Language

Nanyang Technological University

- Lucy is a dynamically typed language with static type checking. The goal of Lucy is to provide an elegant language syntax without losing these safe and powerful features.
- **Technical skills:**YACC, JVM, compiler design.

Skills

Tech	Computer Graphics, Computer Vision, Mesh Optimisation, Deep Learning, Recommendation System and System Architecture Design, etc.
Miscellaneous	Linux, Shell (Bash/Zsh), Latex, Unity, WebGL, Microsoft Office, Firebase, Docker, K8S, Git, etc.
Management	Company Management, Investor Relationship Management, Client Relation Management, Business Development, etc.

Publications

JOURNAL ARTICLES

VR industrial applications—A singapore perspective.
  Gong Y. Syamimi A. Liew R.
  Virtual Reality & Intelligent Hardware 2.5 (2020) pp. 409–420. 2020

Languages

English	Professional proficiency
Chinese	Native proficiency

References available upon request.

Yiwei Gong

解决方案架构师

中国上海, *+86 136 0689 5149* | 新加坡, *+65 9372 5824*

✉ imwithye@gmail.com | 🎓 Feb, 1994 | ⊙ github.com/imwithye | 🔗 linkedin.com/in/yiwei-gong

"The future is now."

个人简介

Yiwei 是一位资深的联合创始人，拥有 AEC 建筑软件行业丰富且卓越的工作经验。他精通计算机图形学、人工智能、Web3、软件架构和云服务开发等技术，擅长从零到一构建云基础架构、持续集成和交付。除了专业技能外，他还拥有出色的业务拓展和公司管理才能。他从零到一成功创立了新加坡和杭州两家公司，服务新加坡政府、香港政府、中国交通建设集团、品茗集团、AECOM 集团等客户，并接受过海峡时报和浙江卫视的采访。Yiwei 拥有南洋理工大学计算机科学学士学位和新加坡国立大学人工智能硕士学位。

Yiwei 是软件架构和云基础架构方面的专家。他尤其精通爬虫、数据抓取、网站逆向、C#、Java 逆向工作，并同时精通 Go、JavaScript、C++、Python 等多门语言。他带领团队实现过大型 Unity 工程、WebGL 工程、k8s 微服务工程以及 Electron 工程等。同时，他具备极强的工程能力，能够帮助 AI 团队实现基础服务开发算法落地。

教育背景

新加坡国立大学   新加坡

人工智能硕士   八月 *2021* - 五月 *2023*

- MComp Study Award Scholarship (优秀学生奖学金)
- **专业方向:** 三维视觉, 计算机图形学, 自然语言处理, 深度学习

新加坡南洋理工大学   新加坡

计算机科学学士   八月 *2012* - 五月 *2016*

- 荣誉学士学位，SM2 全额奖学金
- **竞赛及奖项:** 1. Facebook 亚洲区黑客马拉松第二名，2. 代表 NTU 参加学生超算（Student High Performance Computing）大赛
- **实习和在校经历:** 1. PayPal 使用 Grafana 监控海量交易数据，用 CouchDB 实现分布式 Log 存储和分析。2. 新加坡国立大学担任研究员，研发基于 CUDA 加速的图搜索算法

工作背景

VRcollab Pte. Ltd.   新加坡

联合创始人，董事会成员，CTO   十二月 *2016* - 一月 *2023*

- **关于：** VRcollab 通过重新定义建筑协作，将 BIM 提升至新的高度，使建筑师、工程师、规划师和顾问能够无缝沟通。VRcollab 的知名客户包括 AECOM、Sembcorp A&E、BCA、Surbana Jurong、HDB、NUS、BECA、GreatEarth 等。作为技术负责人和联合创始人，Yiwei 负责以下方面：1. 规划、研发和维护公司技术类基础平台和业务类基础平台；2. 参与业务系统或技术平台的设计和研发工作；3. 管理公司技术类基础平台和技术规范；4. 为项目团队提供技术支持和保障；5. 与相关的产品经理、项目经理和部门经理沟通协调系统开发事宜；6. 与客户和投资者对接，解答相关技术问题。
  相关技术栈： 1. 设计 k8s 运行时环境，开发 Golang、C++ 和 C# 的微服务，并确保微服务之间协同工作。2. 研发 Mesh 转换和优化流水线，实现 BIM 模型一键转换至自定义的二进制格式，并借助 Docker 镜像作为微服务 Worker 发布。3. 研发基于 JavaScript 和 WebGL 的网页模型浏览器，利用层次 Z 缓冲、空间八叉树、渐进式渲染等技术，能够高效渲染超大 BIM 模型。4. 配合图形工程师合作研发了 Unity 下的渐进式全局光照渲染算法。

- **管理成就：** Yiwei 管理着在新加坡和中国的办公室，拥有 30 多名员工。在两年内成功从 4 个投资者筹集了 100 万新加坡元。他们已经与超过 100 家 AEC 公司和 2000 多名专业人士达成了合作。
- **管理技能:** 公司管理，业务拓展，投资者关系管理。

- **技术成就：** 设计和开发整个系统架构、实时渲染流水线、数据处理流水线、模型转换和优化算法以及大型 3D 模型的 Web 查看器。
- **技术技能:** k8s，Docker，Linux，计算机图形学，计算机视觉，深度学习，系统架构，网格处理和大型系统开发。

畅易建筑科技有限公司   杭州

创始人，董事会成员   十二月 *2020* - 一月 *2023*

- **关于：** 畅易是 VRcollab Pte. Ltd. 的子公司，是技术和研究中心。畅易的知名客户包括中国交通建设集团有限公司、品茗科技等公司。Yiwei 负责从零开始组建团队，招聘团队成员并管理公司运营。该公司参与了世界第一高桥塔常泰索塔大桥的数字化交付工作，以及 TollGroup 集团的数字化交付工作，还参与了新加坡 LiHo 奶茶 NFT 的智能合约开发和发行工作。
- **管理成就：** 中国国有企业和上市公司的软件和解决方案供应商。管理 10 多名员工，包括来自王者荣耀的高级开发人员。接受浙江卫视采访，获得杭州余杭高新技术企业引进支持。

新加坡国立大学数据库实验室 新加坡
研究员 *八月 2014 - 一月 2016*
- 关于：担任新加坡国立大学数据库实验室研究员，研究基于 CUDA 加速的 K-mean 算法。该实验室收到了网易和浙江大学的资助。
- 技术技能：CUDA，C++，Linux，Git

项目经历

分布式爬虫系统 上海
AIO Group Inc. *二月 2023 - 六月 2023*
- 项目旨在带领团队设计和实现了分布式爬虫系统，其工作包括调度器设计，正文抽取算法设计，内容重排版算法设计，无头浏览器集成，负载均衡设计，反爬策略逆向和网站 AJAX 请求逆向。
- 该项目通过 Go 和 Chrome Driver 实现了大规模的分布式爬虫系统，并带领团队逆向网站 API，实现正文抽取算法，内容排版算法等。
- 技术技能：Golang，Chrome，Docker，Kubernetes

WebGL 超大场景渐进式渲染系统 新加坡
VRcollab Pte. Ltd. *Dec 2021 - Dec 2022*
- 项目旨在设计和实现一个 BIM 模型的网页查看器。使用层次 Z 缓存、空间八叉树、渐进渲染等技术，基于 ThreeJS 平台实现了超大模型的加载和查看。在网页浏览器上，用户可以享受到高达 60 帧的流畅渲染效果。此外，该项目还实现了屏幕空间的 Object Picking 技术，无需物理和射线引擎即可实现物体提取、物体测量等功能。
- 该项目通过使用 Docker、Wine 和 Kubernetes 进行部署，实现了发布服务。整个流程自动化地完成了 BIM 模型从上传、格式转换、Mesh 优化、空间切分、数据发布等工作。
- 技术技能：WebGL，ThreeJS，遮挡剔除，八叉树，空间加速结构，Docker，Wine，Kubernetes

一站式建筑模型协同平台，公共数据环境 CDE 新加坡
VRcollab Pte. Ltd. *2018 - 2022*
- 该项目的目标是设计和实现建筑 CDE（Common Data Environment），这是一种集成了各种信息及数据管理系统的建筑信息模型（BIM）的共享平台，可以实现相关团队在一个共享的场所上推进设计、建造、管理和运营工作。该平台可以存储、管理并共享各种 BIM 数据和其他相关数据（例如施工计划、进度跟踪数据等），这让项目参与者可以在任何时间和地点访问并更新这些数据。建筑 CDE 有助于实现 BIM 工具的全生命周期管理和应用，提高建筑行业协同性和数据透明度。
- 带领团队实现了模型查看，图纸查看，文档查看，数据存储，数据同步，权限管理，用户管理，审计管理等一系列协同功能。
- 技术技能：VueJS，Golang，Docker，Wine，Kubernetes

BIM 模型合规性检查工具 新加坡
VRcollab Pte. Ltd. *2018 - 2020*
- 该项目实现了一种自动化的 BIM 模型合规性检查工具。BIM 模型合规性检查是在建筑信息模型（BIM）的开发中进行的一种质量控制和合规性检查。目的是确保 BIM 模型符合行业标准、法规和规定，以及满足业主和设计人员的要求。BIM 模型合规性检查覆盖了多个方面，包括模型几何学、属性数据、映射表、协作使用等等。通过检查，可以发现并纠正模型中的错误，避免可能导致造成财产影响或者安全威胁的问题，并确保各个参与方之间的合理协作与沟通，提高 BIM 模型的质量和可靠性。
- 带领团队实现了模型的碰撞检查，属性检查，合规检查等算法。
- 技术技能：计算几何学，C++, ，Docker，Wine，Kubernetes

基于 Unity HDRP 的 BIM 模型渲染引擎 杭州
VRcollab Pte. Ltd. *2021 - 2022*
- 基于 Unity HDRP 管线开发的自定义渲染引擎。能够实时载入 BIM 数据，并提供 4K 图片和视频渲染服务。能够实时模拟天气变幻，季节变换，昼夜变换。对标产品 TwinMotion。
- 该产品已经集成入品茗产品生态圈，已经被超过 200 家客户使用。
- 技术技能：Unity，图形学，光线追踪

在 Unity 中使用自定义渲染系统进行建筑施工模拟的 VR/AR 应用程序 新加坡
VRcollab Pte. Ltd. *2017 - 2022*
- 设计并实现了 Unity 中用于在运行时以 60FPS 加载 BIM 模型（Revit，IFC，SketchUp）的自定义渲染系统，能够流畅的在虚拟现实或者增强现实中使用，并带领团队开发了渐进式全局照明系统。
- 技术技能：Unity，ThreeJS，全局照明，光线追踪

NFT 和智能合约开发 新加坡
VRcollab Pte. Ltd. *十二月 2022 - 一月 2023*
- 设计并实现了 NFT 出版物的智能合约，允许用户使用传统支付系统（Visa，Master 等）在市场上购买 NFT。
- 技术技能：Solidity, Smart Contract.
  Solidity，智能合约

Lucy 编程语言 新加坡
南洋理工大学 *一月 2016 - 五月 2016*
- Lucy 是一种动态类型语言，具有静态类型检查功能。Lucy 的目标是提供优雅的语言语法，同时不失去这些安全而强大的功能。
- 技术技能：YACC，JVM，编译器设计。

相关技能

Tech	基础架构、工程、计算机图形学、计算机视觉、网格优化、游戏引擎、深度学习等。
编程语言	Golang, JavaScript，TypeScript，C#，C++，Managed C++，C, etc.
Miscellaneous	Linux, Shell (Bash/Zsh), Latex, Unity, WebGL, Microsoft Office, Firebase, Docker, K8S, Git, etc.
管理技能	公司管理、技术团队搭建、技术团队管理、投资者关系管理、客户关系管理、业务拓展等。

发表文章

期刊文章

VR industrial applications—A singapore perspective.
Gong Y. Syamimi A. Liew R.
Virtual Reality & Intelligent Hardware 2.5 (2020) pp. 409–420. 2020

语言水平

English 英语	Professional proficiency 专业水平
Chinese 中文	Native proficiency 母语水平

References available upon request.