

Philippe de Bree

Systems and Software Engineer

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Experience

Senior Systems Integration Engineer

Meta via Insight Global | Full-Time

November 2024 - April 2025 | Pittsburgh, PA

Led and supported hardware/software systems engineering across three experimental motion capture stages for VR research, managing high data throughput environments with ~500 TB of audio/video data and long-term datasets totaling ~10 PB.

Built a Bash-scripted data processing asset local to cloud upload pipeline, reducing downtime and organizing the sharing of final data packets with national stakeholders. Implemented OpenCV Python software stack to generate 30+ custom ARTags and perform calibration processing pipeline for 80+ multi-camera calibration. Organized documentation workflow to ensure accurate records of associated calibration and processing assets improving data traceability.

Managed cross functional hardware and software teams to align systems with research stakeholder goals. Oversaw full system lifecycle mitigating scope creep and ensuring reliability by providing live support and performing root-cause analysis to minimize downtime and operational delays. Collaborated with 4 other teams nationally to design research goals and motion capture scripts with 3 months lead time, facilitating research in-take meetings to create actionable capture plans.

Ensured simultaneous recording and live sync of 80+ fiber networked and externally synced GigE cameras controlled by a custom Python software stack. Installed, routed, and troubleshot 500+ channels of RME AVB networked audio over Ethernet via NetGear switch infrastructure, condensing channels to record onto 6 provisioned MacOS machines, and performed regular software validation of video and audio streams to maintain system integrity.

Conducted regular informer tests to identify improvements for capture system hardware and researched industry trends to stay updated on hardware and software advancements, resulting in enhanced system performance. Trained Research Associates on correct system usage, ensuring accuracy and efficiency.

Systems Integration Engineer

Meta via Insight Global | Full-Time

July 2022 - November 2024 | Pittsburgh, PA

Collaborated with Meta CEO's team to produce datasets and set up systems for the world's first cross-country live headset-driven VR Avatar podcast between Mark Zuckerberg and Lex Fridman, enhancing virtual communication capabilities

Designed and built an OpenCV vision detection UI in Python using PyQt to compare user positioning in experimental headsets, minimizing data collection errors. Developed Python toolkits for YAML and JSON script generation and conversion using Pandas, and modified pre-built custom Python headset data collection UIs to meet specific office use cases, improving user interactions and LED lighting configurations

Conducted root-cause analysis on network, hardware, and software bugs for experimental headset and camera dome capture systems, focusing on audio, illumination, video, and depth. Escalated system issues to appropriate stakeholders and worked directly with them to unblock systems. Performed triage of common failures from direct usage and maintenance to organize resolution plans, and provisioned network switches, audio hardware, and control machines (macOS and Windows) for integration into pre-existing systems

Ensured documentation for systems and workflows was up to date, facilitating training and communication among System Integrators to maintain team preparedness. Facilitated technical group syncs to address knowledge gaps, reinforce systems' quality assurance, and improve communication with external technical stakeholders

About

Software Engineer with a background in Systems Engineering and Creative Technology, skilled in leveraging emerging technologies to solve complex problems. Experienced in Agile environments, leading projects like the development of a Python-based UI for VR systems and managing high data throughput environments. Proficient in Python, JavaScript, and React, aiming to apply technical expertise to enhance software development and system integration.

Skills & Tools

Programming

Python JavaScript React CSS
HTML Node SQL Bash
GitHub CI/CD Shell Scripting
PowerShell Apache Airflow ETL
API Design and Development

IT / Systems

Windows MacOS UNIX/Linux
Microsoft Suite Google Drive
Large Data Sets AWS Postman
Command Line Signal Processing
Network Infrastructure
Distributed File Systems
Configuration Management
Chef Ansible Kubernetes

General

Project Management
Technical Documentation
Root-Cause Analysis

Education

Carnegie Mellon University

Bachelor of Fine Arts, concentrating in
Computer Science and Arts
Minor in Film Studies
Aug 2017 - May 2021 | GPA: 3.85
University Honors, Dean's List

BrainStation

Full-Stack Software Engineering
Bootcamp
Sep 2022 - May 2023