

# MAHMOOD UL ISLAM

## Software Engineer | Cloud & AI Specialist

+1-306-261-8482 | [mahmood.islam@gmail.com](mailto:mahmood.islam@gmail.com) | <https://portfolio-mahmoodulislam.vercel.app> | <https://github.com/MahmoodUlislam> | <https://www.linkedin.com/in/mahmoodislam>

## Areas of expertise

**Programming Languages:** JavaScript, Python

### Frontend Development

Frameworks & Libraries: React.js, Next.js, Vue.js, React Native (Expo), PyQt (UI design, app development, installer creation), Swift (iOS native)  
State Management & Utilities: Redux, Vuex, React Query, react-i18next  
Data Visualization & UI Components: Chart.js, ECharts, react-calendar, vue-cal, PDFMake

### Backend Development

Server-Side Development: Node.js, Express.js, Next.js (API & Middleware)  
Serverless & Cloud-Native Backend: AWS Lambda, AWS Amplify Backend  
API Development: RESTful APIs, GraphQL, Apollo GraphQL  
Real-Time Communication: WebSockets, Server-Sent Events (SSE), Amazon Chime SDK, WebRTC, Socket.IO

### Database Management & Storage

Relational Databases: PostgreSQL, MySQL, Amazon RDS  
NoSQL Databases: Firebase Firestore, MongoDB, Amazon DynamoDB  
ORM & Cloud Storage: Prisma, Sequelize, Amazon S3

### Cloud & DevOps (AWS)

Compute & Containers: AWS Fargate (Amazon ECS), Amazon EC2, AWS Lambda, Amazon SageMaker  
Networking & API Management: Amazon API Gateway, VPC, Application Load Balancer (ALB), Network Load Balancer (NLB), EventBridge  
Storage & Databases: Amazon S3, Amazon RDS, Amazon DynamoDB  
Messaging & Streaming Services: Amazon SNS, Amazon SQS, Amazon SES, Amazon Pinpoint, Amazon Data Firehose  
Security & Identity Management: AWS Cognito, AWS Identity and Access Management (IAM), AWS Secrets Manager  
AI & Machine Learning: Amazon SageMaker, Amazon Bedrock, Transcribe, Polly, Amazon Rekognition, HealthLake, Amazon Comprehend  
Monitoring & Automation: Amazon CloudWatch, AWS Step Functions

### Authentication & Security

Protocols & Standards: OAuth 2.0, OpenID Connect (OIDC), AWS Amplify Auth  
Libraries & Tools: Crypto.js, bcrypt.js, Auth0, AWS Cognito

### Build & Deployment Tools

Version Control & CI/CD: GitHub, Bitbucket, GitHub Action, AWS Amplify CI/CD  
Containerization & Bundling: Docker, Docker Compose, Vite, Webpack

### Testing & Code Quality

Testing & Automation: Jest, Puppeteer, Custom Node.js Scripts  
Linting & Formatting: ESLint, Prettier

CMS Integration: WordPress, Storyblok CMS

### Computer Vision

Custom classifiers on SageMaker, Rekognition (pre-screen), OpenCV (preprocessing), image quality gates, confidence thresholds

### AI Workflow Integration:

Designed and productionized multi-agent and computer-vision pipelines across healthcare apps. For LifeLine, built an agentic system on Amazon Bedrock (chatbot, session-summary, and risk-analytics agents) with streaming I/O, Polly TTS, and Transcribe STT; integrated Chime SDK for sessions and ambient listening (text + Rekognition facial/engagement cues) to generate real-time summaries and risk signals, with structured memory and secure backend context injection. For SkinScan, implemented a two-stage CV pipeline—Rekognition pre-screen (skin/quality) → custom vision model trained and deployed on Amazon SageMaker—with confidence thresholds, safe defaults, and CloudWatch monitoring (latency/error/confidence) and rollback. Both solutions run in VPC-isolated AWS environments with Cognito auth, presigned S3 media flows, and full audit/reporting for privacy and accountability.

## Experience

### Virtual Health Hub

**Senior Software Developer | Cloud & AI Specialist**

*Software Developer*

**Location:** Saskatoon, Saskatchewan, Canada

**Project:** “LifeLine” (<https://virtualhealthhub.ca/>), (<https://research-groups.usask.ca/remote-presence/>), (<https://lifelineapp.ca/>)

Virtual Mental Health Treatment Platform

**Technologies:** JavaScript, React.js, Vue.js, Quasar, React Native (Expo), Node.js, Express.js, REST APIs, PostgreSQL, SASS, CSS

**AWS Services:** Amplify, API Gateway, Bedrock, ECS (Fargate), RDS, EventBridge, Chime SDK, Lambda, Step Functions, S3, CloudWatch, Amazon Pinpoint, Cognito, Amazon Rekognition, Amazon Comprehend, Amazon Polly, Amazon Transcribe, Amazon Data Firehose.

### Key Responsibilities & Contributions:

**Project Leadership:** Managing the LifeLine Project end-to-end, including development, cloud infrastructure, and solution architecture, ensuring scalability and compliance with healthcare standards.

### Full-Stack System Development:

- Built a highly scalable system using Next.js, Vue.js, React.js, Quasar, and React Native (Expo) for enterprise-level healthcare applications, maintaining HIPAA compliance.
- Built a fully dynamic appointment booking and medication management system for clinicians and patients, including useful analytics and notifications.
- Created an AI chatbot with voice/text to generate tailored responses according to the patient’s data, create session summaries & synchronize with clinician portal; all within a secure VPC with AWS cloud infrastructure. Created a natural conversation with the AI chatbot using Amazon Polly.

*March 2025 – Present*

*August 2024 – February 2025*

- Developed a video conference ambient listening to summarize the meeting with Chime SDK, Transcribe, S3 and Bedrock.
- Built an Agentic AI system by Amazon Bedrock with the collaboration of multiple agents (AI chatbot agent, Video conference summary agent, Agent for risk analytics/alert)
- Developed and maintained REST APIs & WebSocket using Node.js and Express.js, backed by PostgreSQL, Prisma, Socket I/O, AWS API gateway, ALB/NLB, ECS-Fargate, Amazon Cognito, EventBridge, SES and many more.
- Created custom libraries and internal applications to enhance system efficiency and improve client management.
- Developed a native custom module in Expo using Swift & Kotlin to bridge Amazon Chime SDK with React Native, enabling seamless audio/video conferencing capabilities.
- Created a Vite compilation bundle to integrate Vue.js and React.js components within the same Quasar app, allowing smooth execution of Amazon Chime SDK React components alongside Vue-based UI.

#### Cloud Infrastructure & Security:

- Architected and managed AWS cloud infrastructure, including Cognito, ECS (Fargate), RDS, EventBridge, Pinpoint, API Gateway, and Chime SDK for secure and scalable operations.
- Implemented secure authentication mechanisms with AWS Cognito and Auth0 for seamless user management.

#### AI & Machine Learning Integration:

- Developing an AI Agent using AWS Bedrock and Kinesis to enhance medical data processing, automation, and real-time insights.
- Integrated Amazon Chime SDK with Amazon Transcribe, Rekognition, and Bedrock for real-time audio/video analysis, AI-driven chatbot interactions, and structured medical record processing using Amazon HealthLake.

#### Feature Development for Virtual Healthcare:

- Designed and developed an appointment booking system with a complete workflow for a Virtual Clinic, optimizing doctor-patient interactions.
- Developed a medication management system and an AI chatbot that integrates with the project's AI Agent, enhancing patient adherence and physician oversight.

#### Stakeholder & Research Collaboration:

- Collaborating with stakeholders and medical professionals to enhance system efficiency and gather requirements.
- Conducting usability tests in rural Saskatchewan, collecting patient feedback to refine AI-driven healthcare solutions.

**Project:** “SkinScan” (<https://virtualhealthhub.ca/>), (<https://research-groups.usask.ca/remote-presence>), (<https://skinscanapp.ca/>)

AI Dermatology Imaging Platform (End-to-End)

**Technologies:** Swift (iOS native, AR-guided capture), Next.js (doctor portal), Node.js, Express.js, REST APIs, PostgreSQL, SASS/CSS

**AWS Services:** Amazon SageMaker (real-time inference), Rekognition (image pre-screening), S3, API Gateway, ECS Fargate, RDS, EventBridge, CloudWatch, Cognito, IAM, Secrets Manager

#### Summary

Designed and delivered an end-to-end dermatology imaging platform comprising a native iOS capture app, an AWS computer-vision pipeline, and a clinician portal. Incoming photos are pre-screened by Amazon Rekognition for skin presence and image quality, then routed to a **custom vision model** that I **trained and deployed in Amazon SageMaker** (fine-tuned on publicly available dermatology datasets) for final analysis. A centralized backend coordinates ingestion, inference, case management, and comprehensive auditing.

#### Key Responsibilities & Contributions

**Project leadership & architecture:** Designed the full cloud/application architecture (VPC, networking, CI/CD), aligning with healthcare privacy best practices and reusing proven patterns from LifeLine.

#### Computer vision & modeling:

- Fine-tuned and deployed a dermatology image classifier as a **SageMaker real-time endpoint** with versioning, rollback, and CloudWatch monitoring.
- Implemented a **two-stage pipeline**: **Rekognition** gate for skin presence/quality, and **custom classifier** with confidence thresholds and safe defaults.

#### iOS app (Swift, AR-guided):

- Built **AR-guided photo capture** and library import with on-device checks; integrated Rekognition pre-screen calls to block low-quality/irrelevant shots before upload.
- Secure media handling (presigned S3 uploads, retries, background transfers) and UX tuned for diagnostically useful images.

#### Doctor portal (Next.js):

- Developed a clinician portal for **patients, cases, waitlist, and triage**.
- Case view with image viewer, **model prediction + confidence**, status transitions, and notes/audit history.

#### Backend (centralized, Node/Express):

- Built a centralized service that orchestrates ingestion, pre-screening, model inference, and persistence, fronted by Amazon API Gateway (public APIs) and an internal Network Load Balancer (NLB) for ECS services; secured with Amazon Cognito authorization, rate limiting, and structured logging; productionized with CI/CD; and integrated with Prisma for PostgreSQL.

## Saaska Software Inc.

**Software Engineer and Technical Support Assistant**

**April 2023 – June 2024**

**Location:** Saskatoon, Saskatchewan, Canada

**Project:** “esiKidz” (<https://esikidz.com/>) childcare management software.

#### Project’s usage:

JavaScript, React.js, React Native, Node.js, REST APIs, MySQL, SASS, CSS, Git, Bitbucket, Trello, Jira.

- SAAS development by React.js & React Native at the enterprise level.
- Specialize in developing and managing secure web and mobile apps.
- Learning data science by creating apps for web crawling, data extraction, and manipulation.
- Creating & practicing various libraries for data extraction, filtration, and React UI styling.
- Experiencing AWS Lambda, Amazon-S3, and other related technologies.
- Developing multiple internal applications & custom libraries to support the software system in efficiently managing clients.

#### Project’s specific works:

- Working collaboratively in a team to maintain the overall architecture and develop a highly scalable system integrated with ReactJS & React-Native APPs, communicating via Node JS API services.
- Performing optimization of the developer toolchain to support instant provisioning of new services and infrastructure, fully automating the deployment, and minimizing

development friction.

- Designing and implementing to improve software's reliability, scalability, performance, and security.
- Supporting Business Development and Marketing by creating internal software to enhance tasks.
- Performing software testing, improving existing systems, and adding new features.
- Creating and maintaining documentation on test and development operations.
- Demonstrating the system to new customers and providing technical support to existing customers.

## SELISE Digital Platforms

Software Engineer

June 2022 – Aug 2022

**Project:** "Sunrise-club" (<https://www.sunrise.ch/en/moments>), an Event booking site for the Telco (Sunrise) users of Switzerland

### Project's usage:

JavaScript, TypeScript, React.js, Next.js, MongoDB, REST APIs, Storyblok CMS, Material UI, Ant Design UI, React-bootstrap, SASS, bootstrap, CSS, GitHub, Jira.

- Learned Next.js at the enterprise level, the pros, and cons of using Next.js to maintain URL redirection
- Created a website with high security and maintained a web firewall
- Learned to implement OAuth 2 + OIDC and learned to implement Adobe Analytics
- Experienced using Material UI + React-Bootstrap and SASS
- Proficient in using logger in the project, Building API in Next.js, implementing Storyblok CMS, and MongoDB database
- Practiced using SWR with Axios, Crypto.js, and Lodash.

### Project's specific works:

- Maintained URL redirect with WAF (Web Application Firewall) in the production site. Creating an API & middleware through Next.js
- Maintained 3 test environments and helped my peer with fixing up the commit history on the main branch in our project
- Created documentation with code standards of the codebase of our project, implementing CSS modules into our main project
- Constructed a complete language translation system

## Quantic Dynamics Ltd.

Web Developer

Feb 2019 – May 2022

### Project's usage:

JavaScript, React.js, Next.js, MongoDB, Firebase, Material UI, Ant Design UI, React-bootstrap, SASS, Bootstrap, CSS, GitHub, GitLab, Trello.

- Learned to use SWR with Axios, Crypto.js, and Lodash, as well as learned to use cookies and query parameters.
- Implement search and sort functions and manipulate data from the user using Node.js.
- Experienced using Material UI + Ant Design and SASS altogether.
- Customized fully responsive websites with mobile, tablet and desktop views.
- Architected frontend & backend solutions, implementing asynchronous client-server communication via REST API and setting up the server with databases.

## Education

- Applied Certificate in Website Design and Development: Saskatchewan Polytechnic
- Bachelor of Science in Textile Engineering: Ahsanullah University of Science & Technology (WES Canadian equivalency 4-year bachelor, Ref# 4848976)