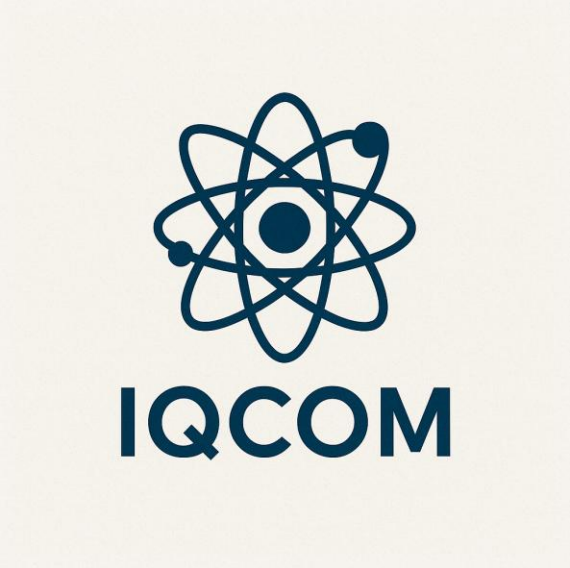


IQCOM 2025

1st International Quantum Computing Workshop
Proceedings
Saturday, May 17, 2025
Concordia University Chicago

Organized by:

• Dr. Luis Nuñez, Chemistry Department

• Dr. Victor Govindaswamy, Computer Science Department

• Dr. Vladimiro Mujica, Arizona State University

Table of Contents

Program Schedule

All times are listed in Central Standard Time (CST).

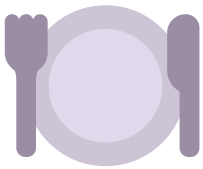
No.	Presentation	Location / Start Time
	Materials and Engineering Session	
1	Dr. Vladimiro Mujica	CC200 Auditorium / 8:30 AM
2	Robert Johnson III, MS	CC200 Auditorium / 9:20 AM
	Break	CC200 Auditorium / 10:00–10:15 AM
3	Dr. Lorenzo Echevarria	CC200 Auditorium / 10:15 AM
4	Dr. Julio Palma	CC200 Auditorium / 10:55 AM
5	Dr. Vivian Santamaria-Garcia	CC200 Auditorium / 11:40 AM
	Lunch Break	12:20–1:30 PM
6	Dr. Victor Govindaswamy	CC200 Auditorium / 1:30 PM
	Poster Session	
7	Poster Presentations (In-person & online presenters)	River Forest Room / Online 2:10 PM
8	Workshop Adjourns	River Forest Room / 4:30 PM

Notes:

- The first presentation (Dr. Mujica) will be delivered in person. All other talks will be streamed online and viewed from the auditorium (Christopher Center 200).
- Most poster presentations will be held in person (River Forest Room in Koehneke Community Center); select presenters may participate virtually.
- Online Access: Microsoft Teams link

QR code for team's online link

QR code for Conference Website



Nearby Restaurants for In-Person Attendees

Since the campus cafeteria may be closed, here are some nearby dining options:

- **Lou Malnati's Pizzeria – Famous for Chicago deep-dish pizza**
- **Giordano's – Another renowned spot for deep-dish pizza**
- **Hemmingway's Bistro – Offers French-American cuisine in a cozy setting**
- **Johnnie's Beef – Known for classic Italian beef sandwiches**
- **Rustico – Serves Mediterranean-inspired dishes**
- **The Little Gem Café – Offers American fare with a European twist**

For a more extensive list, you can explore:

👉 **TripAdvisor: Restaurants Near Concordia University Chicago**

MATERIAL AND ENGINEERING SESSION

8:30 AM – 12:20 PM | Hybrid: Online & Christopher Center CC200 Auditorium

1. 8:30 AM – 9:20 AM

Theoretical and Computational Tools for the Design of Molecules and Materials

Speaker: Dr. Vladimiro Mujica, Arizona State University, Phoenix, AZ

This talk explores the synergy between theory and computation in the design of molecules and materials. Theoretical methods span from quantum electronic structure to semiclassical molecular dynamics for understanding properties at various scales. The computational landscape has been reshaped by Artificial Intelligence, particularly Machine Learning, which now accelerates material discovery.

Special focus will be given to applications in molecular sensors, pharmacology, electronics, and spintronics, illustrating how the interplay of theory and computation enables practical advancements.

2. 9:20 AM – 10:00 AM

A Plan for Leveraging Quantum as a Driver for Economic Development and Community Transformation

Speaker: Robert Johnson III, Cimcor Inc., Merrillville, IN

This presentation outlines a strategic framework to position Northwest Indiana as a hub of innovation within the broader Chicago quantum ecosystem. It covers:
- An overview of quantum computing and networking, with implications for cryptography and advanced analytics
- Assessment of cybersecurity threats in the quantum era
- A three-pillar action plan:
  • Quantum Crossroads: Interconnecting labs, universities, and industries

- Robert's Impact Lab at Purdue Northwest: Translating research into tools
- Community empowerment through STEM outreach and workforce development

The presentation argues for regional coordination to catalyze inclusive growth and technological leadership.

10:00 AM – 10:15 AM | Break

3. 10:15 AM – 10:55 AM

Quantum Computing for Quantum Chemistry: Foundations, Algorithms, and Prospects

Speaker: Dr. Lorenzo Echevarria, University Polytechnic of Puerto Rico

This talk delves into how quantum computing addresses the limitations of classical quantum chemistry simulations. Emphasis is placed on the Variational Quantum Eigensolver (VQE) algorithm, exploring:
- Construction of molecular Hamiltonians
- Parameterized quantum circuits (e.g., UCCSD ansatz)
- Implementation using platforms like NVIDIA CUDA-Q

Challenges such as noise, decoherence, and error mitigation will be discussed, alongside the path forward for applying quantum computation in drug discovery and materials science.

4. 10:55 AM – 11:40 AM

Exploring Strategies for Controlling Electron Transport in Molecular Devices

Speaker: Dr. Julio Palma, Penn State University, Fayette – The Eberly Campus

Molecular electronics seeks to utilize individual molecules as functional electronic components. This session highlights:

- Theoretical models of electron transport regimes
- Design of organic conjugated systems and biomolecules as nanoscale devices
- The role of quantum interference in optimizing molecular circuits

By investigating structure-function relationships, this work supports the engineering of future nanoscale electronic systems.

5. 11:40 AM – 12:20 PM

Tailoring Light–Matter Interaction in Layered Materials for Quantum Photonic Applications

Speaker: Dr. Vivian Santamaria-Garcia, MIT, Cambridge, MA

Layered materials offer unique platforms for manipulating light at the quantum scale. This talk presents:
- Optical properties such as strong excitonic effects, infrared sensitivity, and defect-based photoluminescence
- Experimental studies and first-principles modeling
- Potential applications in quantum photonic devices operating under extreme conditions

The insights support the development of next-generation materials for quantum optics and communication.

12:20 PM – 1:30 PM | Lunch Break

6. 1:30 PM – 2:00 PM

Quantum Algorithms and Quantum AI: Bridging Theory and Real-World Applications in Computer Science

Speaker: Dr. Victor Govindaswamy, Concordia University Chicago, River Forest, IL

This presentation examines the impact of quantum computing in computer science, emphasizing:

- Core algorithms like Shor's (factoring) and Grover's (search)
- The convergence of Quantum Computing and AI (Quantum AI)
- Applications in cryptography, optimization, and machine learning

Attendees will gain insight into how these breakthroughs are shaping the future of computing and solving complex real-world challenges.

POSTER SESSION

(2:10 PM – 4:30 PM)

(Online and River Forest Room, Concordia University Chicago)

1. MediCheck App: A Smart Medical Diagnosis Assistant

Author(s): Arya Desai, Victor Govindaswamy

Institution: Concordia University Chicago

Email: crf_desaia2@cuchicago.edu

Abstract:

This project introduces MediCheck, a C++-based interactive diagnosis tool designed to help users identify common illnesses such as the flu, cold, COVID-19, or food poisoning by analyzing symptom input through conditional logic. The system incorporates input validation and structured decision-making using if, if-else, and logical operators to ensure accurate user guidance.

The application reinforces foundational C++ concepts and promotes logical reasoning and real-world problem-solving skills, offering both educational and practical value.

Future directions include:
- AI: Advanced symptom pattern analysis using machine learning
- Blockchain: Tamper-proof storage for patient history and diagnostic results
- Quantum Computing: Optimized computation for real-time diagnosis

2. Next-Generation Software Engineering: Enhancing Reusability with AI, Blockchain, and Quantum Computing

Author(s): Raj Kumar Giri, Victor Govindaswamy

Institution: Concordia University Chicago

Email: crf_girir@cuchicago.edu

Abstract:

This project explores methods to improve software reusability—a key factor in achieving high-quality, maintainable, and efficient software. It focuses on soft computing approaches such as fuzzy logic and neural networks to evaluate and predict reusable components during early development phases.

The goal is to reduce redundant coding efforts and increase productivity through strategic reuse of code and system components.

Future directions include:
- AI: Reusability prediction using machine learning models
- Blockchain: Decentralized repositories and smart contracts for code licensing and verification
- Quantum Computing: Efficient refactoring strategies and reusable code optimization through quantum algorithms

3. RoPaS: A Rock-Paper-Scissors Interactive Console Game in C++ with Future AI, Quantum, and Blockchain Enhancements

Author(s): Raj Kumar Giri, Victor Govindaswamy

Institution: Concordia University Chicago

Email: crf_girir@cuchicago.edu

Abstract:

RoPaS is a console-based Rock-Paper-Scissors game developed in C++ for Ubuntu. The computer opponent's choices are randomized, and the game logic is built using conditional statements, loops, and input validation. It promotes interactive learning while reinforcing basic programming constructs such as randomness, control flow, and modular logic.

Future directions include:
- AI: Opponent behavior adaptation using learning models
- Blockchain: Secure recording and verification of multiplayer match results
- Quantum Computing: Integration of quantum-generated randomness for unpredictability

4. BISTRO: Design and Implementation of a Smart Budget Tracker for Secure and Intelligent Personal Finance Management

Author(s): Rushikesh Nayak, Victor Govindaswamy

Institution: Concordia University Chicago

Email: crf_nayakr@cuchicago.edu

Abstract:

BISTRO (Budgeting Intelligently with a Secure Tracker for Responsible Oversight) is a C++-based personal finance system built using object-oriented programming principles. It supports salary input, expense tracking, transaction logging, persistent storage, and report generation through an interactive menu.

The system emphasizes code modularity, user-friendly design, and secure data handling.

Future directions include:
- AI: Financial trend prediction and smart spending recommendations
- Blockchain: Immutable storage of financial transactions for added transparency
- Quantum Computing: Acceleration of financial computations and optimization routines

5. SMART Loan Calculator: Secure, Modular, AI-driven, Reliable, and Transparent Financial Planning

Author(s): Akashkumar Patel, Victor Govindaswamy

Institution: Concordia University Chicago

Email: crf_patela18@cuchicago.edu

Abstract:

This project introduces a C++ program that calculates monthly loan repayments based on loan amount, annual interest rate, and repayment period. The application converts annual interest rates to monthly values and accounts for both zero-interest and interest-based repayment models.

By applying a modular and structured approach, the SMART Loan Calculator enhances financial literacy while reinforcing fundamental C++ programming skills.

Future directions include:
- AI: Predictive analytics for interest trends and repayment optimization
- Blockchain: Smart contracts for secure loan tracking and tamper-proof agreements
- Quantum Computing: Accelerated calculations for complex loan structures

6. SMART-Save: Secure, Machine-Assisted, AI-Driven, Reliable, and Transparent Savings Planner

Author(s): NagaJayaMadhuPraveen (Praveen) Mahadeva, Victor Govindaswamy

Institution: Concordia University Chicago

Email: crf_mahaden@cuchicago.edu

Abstract:

SMART-Save is a C++-based application that assists users in setting and reaching their savings goals. It calculates the time required based on goal amount and monthly savings, offering simple guidance for financial planning.

Future enhancements include:
- AI: Analyze spending patterns and suggest savings strategies
- Blockchain: Tamper-proof financial history
- Quantum Computing: Accelerate complex projections and financial modeling

7. Strategic Project Estimation and Planning: WBS, FPA, COCOMO, and PERT in Modern Development

Author(s): Akashkumar Patel, Victor Govindaswamy

Institution: Concordia University Chicago

Email: crf_patela18@cuchicago.edu

Abstract:

This project outlines four essential planning methodologies—WBS, FPA, COCOMO, and PERT—to improve scope definition, estimation accuracy, and resource optimization in software engineering.

Each technique enhances project visibility and reliability. Future directions include:
- AI: For prediction models
- Blockchain: Transparent tracking and milestone validation
- Quantum Computing: Enhanced simulation and estimation of cost and timelines

8. Design and Implementation of RAIQA, an AI-Enhanced Predictive Healthcare System, for Rare Disease Diagnosis Using Agile Scrum Methodology

Author(s): Nandini Yarava, Victor Govindaswamy

Institution: Concordia University Chicago

Email: yaravanandini@gmail.com

Abstract:

RAIQA is a mobile app for early detection of rare diseases using AI-driven analysis of user symptoms. It features doctor suggestions, electronic record handling, and GUI integration built on MVC and Firebase, using Adobe XD and XML.

Developed using Agile Scrum, its future vision includes:
- AI: Enhanced NLP and deep learning diagnostics
- Blockchain: Secure health record sharing
- Quantum Computing: Advanced diagnostic data analysis

9. Design and Implementation of DIBAQ, an AI-Driven Drug Safety Application Using Agile Scrum Methodology

Author(s): Manoj Kumar Narige, Victor Govindaswamy

Institution: Concordia University Chicago

Email: crf_narigem@cuchicago.edu

Abstract:

DIBAQ is an Android app for checking drug interactions, identifying pills, and accessing drug info using APIs like OpenFDA. Built with Jetpack Compose, Adobe XD, and Firebase, it emphasizes user security and usability.

Future enhancements include:
- AI: Personalized medicine insights
- Blockchain: Tamper-proof prescriptions
- Quantum Computing: Advanced pharmaceutical analysis

10. NOVA: Next-gen Operational View for AI – A Unified Schema for AI Model Lifecycle Management

Author(s): Raj Kumar Manala, Victor Govindaswamy

Institution: Concordia University Chicago

Email: crf_manalar@cuchicago.edu

Abstract:

NOVA offers a centralized schema for managing AI models across their lifecycle—training, evaluation, deployment, and monitoring. The system includes tracking for datasets, experiments, hyperparameters, metrics, and deployments.

Future work includes:
- AI: Automated retraining and model drift detection
- Blockchain: Verifiable audit trails
- Quantum: Support for quantum ML workflows

11. Cryptocurrency Price Tracker

Author(s): Nishanth Reddy Bokka, Victor Govindaswamy

Institution: Concordia University Chicago

Email: crf_bokkan@cuchicago.edu

Abstract:

The Cryptocurrency Price Tracker is a C++ application utilizing OOP and STL containers to track and analyze cryptocurrency prices. It includes functionality for dynamic input, sorting, analysis, and search operations using pointers and vectors.

Future scalability includes:
- Integration with real-time APIs (e.g., CoinGecko)
- GUI development with Qt
- AI, Blockchain, and Quantum extensions for secure and advanced financial analytics

12. H-MED: A Secure and Intelligent Hospital Management Database System with AI, Blockchain, and Quantum Innovations

Author(s): Mishree Minalkumar Patel, Victor Govindaswamy

Institution: Concordia University Chicago

Email: crf_patelm11@cuchicago.edu

Abstract:

H-MED is a hospital database system emphasizing secure and accessible record-keeping for patients, appointments, and billing. It includes encryption, real-time updates, and role-based access control.

Future directions:
- AI: Predictive healthcare analytics
- Blockchain: Immutable patient records
- Quantum: High-speed diagnostic modeling

13. MediCrypt: A Secure Medical Data Encryption and Decryption System Using Image Steganography

Author(s): Mishree Minalkumar Patel, Victor Govindaswamy

Institution: Concordia University Chicago

Email: crf_patelm11@cuchicago.edu

Abstract:

MediCrypt uses Python, Tkinter, and Pillow to securely embed text data into images using steganography. It supports encoding/decoding medical data while preserving image integrity.

Future integration:
- AI: Stego-key generation and key management
- Blockchain: Audit trails and access logs
- Quantum: Secure encryption with QKD

14. Agile Scrum in Modern Software Engineering: Applications in AI, Blockchain, and Quantum Computing

Author(s): Sai Charan Beemara, Victor Govindaswamy

Institution: Concordia University Chicago

Email: charanbeemara81819@gmai.com

Abstract:

This study explores Agile Scrum principles applied in emerging domains like AI, Blockchain, and Quantum Computing. It emphasizes sprint-based iterations, user stories, and adaptive planning.

AI: Rapid model iteration
Blockchain: Decentralized app sprint cycles
Quantum: Collaborating with cross-domain teams

15. AURA: An Advanced Unified Repository for Atmospheric Data Management

Author(s): Smita Krishnan, Victor Govindaswamy

Institution: Concordia University Chicago

Email: crf_krishns@cuchicago.edu

Abstract:

AURA is a data management system for climate monitoring and environmental trends, integrating weather, policy, disaster, and emission data. It enables forecasting and supports real-time decision-making.

Future directions:
- AI: Predictive climate modeling
- Blockchain: Transparent policy tracking
- Quantum: Real-time climate analytics

16. FINSI: A CS2-Level Menu-Driven Credit Card Interest Navigator with Smart Insights

Author(s): Tate Johnson, Victor Govindaswamy

Institution: Concordia University Chicago

Email: Tatejo408@gmail.com

Abstract:

FINSI is a C++ application that calculates credit card interest over selected periods using a menu-driven interface and vector-based storage. It teaches OOP concepts like getters, setters, and abstraction.

Future integration:
- AI: Personalized repayment plans
- Blockchain: Transaction transparency
- Quantum: Interest optimization algorithms

17. FISCAL: A Financial Information System for Colleges & Academic Leadership

Author(s): Smita Krishnan, Victor Govindaswamy

Institution: Concordia University Chicago

Email: crf_krishns@cuchicago.edu

Abstract:

FISCAL is a modular C++ application for managing finances in educational institutions. Modules include payroll, procurement, tuition, and grant management.

Future expansion:
- AI: Financial forecasting

- Blockchain: Secure financial records
- Quantum: Portfolio optimization and simulation

18. SPARK: Smart Portfolio Analysis and Returns Keeper

Author(s): Marcin Hoffman, Victor Govindaswamy

Institution: Concordia University Chicago

Email: crf_hoffmams@cuchicago.edu

Abstract:

SPARK is a menu-driven C++ portfolio manager built using OOP and vectors. It analyzes investments and evaluates return on stock portfolios.

It emphasizes UML design, modular architecture, and scalability, with future enhancements for AI-driven risk assessment and quantum optimization.

19. TRAFFIC: Transportation Real-time Analytics, Forecasting, and Flow Information Control

Author(s): Huda Bakr Baldawi, Victor Govindaswamy

Institution: Concordia University Chicago

Email: crf_bakrbahm@cuchicago.edu

Abstract:

TRAFFIC is a relational database system for smart city traffic management. It processes data from environmental, vehicle, and user sources to optimize flow and safety.

Future applications:
- AI: Accident prediction
- Blockchain: Secure traffic reporting
- Quantum: Real-time traffic routing algorithms

20. SMART-MED: Secure Medical Assets & Resource Tracking with AI, Blockchain, and RBAC

Author(s): Wirata Korkitcharoenkul, Victor Govindaswamy

Institution: Concordia University Chicago

Email: crf_korkitw@cuchicago.edu

Abstract:

SMART-MED is a secure inventory management system for medical supplies. Built with RBAC, it restricts access and ensures accurate tracking.

Future enhancements:
- AI: Anomaly detection and demand forecasting
- Blockchain: Immutable tracking ledger
- Quantum: Logistics optimization

21. UniStay: AI-Enhanced, Community-Driven, and Scalable Accommodation Platform

Author(s): Muhammad Waqas Sindhu, Victor Govindaswamy

Institution: Concordia University Chicago

Email: Waqas.sindhu181@gmail.com

Abstract:

UniStay is a MERN-stack inspired web app connecting students to local housing near universities. It features real-time listing management, secure authentication, and role-based functionality.

Future Enhancements:
- AI: Personalized housing suggestions
- Blockchain: Semohacure housing contracts
- Quantum: Matching optimization

22. WIS: A Smart Financial Management System Using Agile Scrum Methodology

Author(s): Shanumuka Mohan Kumar Guptha Bhavanasi, Victor Govindaswamy

Institution: Concordia University Chicago

Email: bsmkumar18@gmail.com

Abstract:

WIS is a personal finance tracker integrating budgeting, income tracking, and real-time insights. Built using Firebase and Agile Scrum, it emphasizes user-centric iterative development.

Future Enhancements:
- AI: Predictive analytics
- Blockchain: Secure financial transactions
- Quantum: Real-time budget simulations

23. Securing Healthcare Networks: Protecting Medical Devices and Patient Data

Author(s): Sania Sadaf, Victor Govindaswamy

Institution: Concordia University Chicago

Email: Crf_sadafs@cuchicago.edu

Abstract:

This project outlines a healthcare cybersecurity framework to defend against cyberattacks using encryption, MFA, IDS, and continuous monitoring.

Future Work:
- Blockchain: Immutable data logs
- AI: Threat detection
- Quantum: Post-quantum cryptography

24. RUST: Trusted Resilient Unified Secure Transactions Framework for Online Banking Security

Author(s): Pranav Singh, Victor Govindaswamy

Institution: Concordia University Chicago

Email: pranavsingh2510@gmail.com

Abstract:

RUST is a Python-based framework for online banking security integrating encryption, MFA, and AI-powered fraud detection.

Future Enhancements:
- AI: Threat anticipation
- Blockchain: Secure transaction logs
- Quantum: Resistant cryptographic protocols

25. HEAL: Healthcare Enterprise Automation Layer

Author(s): Pranav Singh, Victor Govindaswamy

Institution: Concordia University Chicago

Email: pranavsingh2510@gmail.com

Abstract:

HEAL is a hospital data management system built on Oracle SQL and Java JDBC with modular UI, enabling efficient record keeping and appointment management.

Future Enhancements:
- AI: Clinical decision support
- Blockchain: Data integrity
- Quantum: Predictive healthcare modeling

26. GLEAM: Get Live Events and More — A Smart Platform for Seamless Event Discovery and Creation

Author(s): Brandon Montford, Victor Govindaswamy

Institution: Concordia University Chicago

Email: crf_montfobj@cuchicago.edu

Abstract:

GLEAM is an event management app for discovering, booking, and creating live events. It offers secure authentication, receipt generation, and user-friendly navigation.

Future Goals:
- AI: Event recommendation engines
- Blockchain: Ticket ownership and resale
- Quantum: Event scheduling optimization

27. PULSE: A Scalable, Intelligent, and Secure Patient Monitoring System for the Future of Healthcare

Author(s): Adnan Mustafa Ali, Victor Govindaswamy

Institution: Concordia University Chicago

Email: crf_alia8@cuchicago.edu

Abstract:

PULSE is a C++-based patient health monitoring tool using vector-based storage and file handling. It tracks vitals and flags critical cases.

Future Enhancements:
- AI: Predictive analytics
- Blockchain: Tamper-proof records
- Quantum: Fast diagnostics

28. Securing the Ledger: Cybersecurity and Risk Management in the Digital Age of Accounting

Author(s): Adnan Mustafa Ali, Victor Govindaswamy

Institution: Concordia University Chicago

Email: crf_alia8@cuchicago.edu

Abstract:

This project discusses financial data threats and proposes a cybersecurity-first mindset in accounting with proactive defenses and audit capabilities.

Innovations:
- AI: Fraud detection
- Blockchain: Immutable ledgers
- Quantum: Next-gen encryption

29. FABIQ – Future-Ready Financial Data Management

Author(s): Chandu Akena, Victor Govindaswamy

Institution: Concordia University Chicago

Email: crf_akenac@cuchicago.edu

Abstract:

FABIQ is a C++ system for financial data using STL, UML, copy constructors, and operator overloading for optimized data processing.

Future Work:
- AI: Forecasting
- Blockchain: Secure audit trails
- Quantum: High-speed calculations

30. CARDIAC: C++-Based Automated Risk Detection and Intelligent Assessment for Cardiology

Author(s): Sania Sadaf, Victor Govindaswamy

Institution: Concordia University Chicago

Email: Crf_sadafs@cuchicago.edu

Abstract:

CARDIAC is a rule-based C++ system for heart disease risk using menu-driven input, scoring, and diagnostic feedback.

Future Enhancements:
- AI: ML-based prediction
- Blockchain: Secure storage
- Quantum: Real-time cardiology models

31. Modern Banking Database with Fraud Detection and Loan Management

Author(s): Omon Ibodullaev, Victor Govindaswamy

Institution: Concordia University Chicago

Email: crf_ibodulo@cuchicago.edu

Abstract:

This banking database system includes over 15 relational tables to support core operations such as customer management, transactions, loans, and fraud detection. Built with SQL and security mechanisms like KYC and 2FA, it ensures robust compliance.

Future Work:
- AI: Fraud analytics
- Blockchain: Secure ledgers
- Quantum: Encryption and real-time transaction risk analysis

32. SmartATM: A C++ Simulation with OOP, Vectors & Menu-Driven Interface

Author(s): Juan Moresco, Victor Govindaswamy

Institution: Concordia University Chicago

Email: crf_morescji@cuchicago.edu

Abstract:

SmartATM simulates an interactive ATM system using C++ and vectors. Users can view balances, deposit, or withdraw using a secure menu-driven interface with getters/setters and encapsulation.

Future enhancements:
- AI: Fraud detection
- Blockchain: Secure audit trails
- Quantum: High-speed encryption

33. Design and Implementation of SmartCart using Agile Scrum Methodology

Author(s): Bharath Medak, Victor Govindaswamy

Institution: Concordia University Chicago

Email: bharathmedak1@gmail.com

Abstract:

SMARTCART is a mobile shopping app with AI-powered search and secure shopping workflows. It includes real-time Firebase storage, user verification, and MVC architecture developed using Agile Scrum.

Future Features:
- AI: Customer targeting
- Blockchain: Product authentication
- Quantum: Logistics & price optimization

34. Design and Implementation of HEAL, a Smart, Secure, and Scalable Healthcare, using the Agile Scrum Methodology

Author(s): Vamshidhar Reddy Chittepu, Victor Govindaswamy

Institution: Concordia University Chicago

Email: crf_chittev@cuchicago.edu

Abstract:

HEAL is a mobile health tracking application that manages vitals, appointments, and lifestyle data. It emphasizes wellness through smart insights and a clean UI.

Future Work:
- AI: Personal health recommendations
- Blockchain: Secure health data
- Quantum: Predictive modeling for chronic conditions

35. Design and Implementation of VAQUA, an AI-Driven Child Vaccine Tracker, Using Agile Scrum Methodology.

Author(s): Avinash Kumar Kondoju, Victor Govindaswamy

Institution: Concordia University Chicago

Email: crf_chittev@cuchicago.edu

Abstract:

VAQUA is an Android vaccine scheduling app developed with Firebase and Adobe XD. It sends reminders and helps parents maintain digital records.

Future Enhancements:
- AI: Personalized vaccination advice
- Blockchain: Tamper-proof records
- Quantum: Real-time optimization for scheduling

36. Smart Anomaly Navigation and Detection Using C++ for Real-Time Sensor Data Streams

Author(s): Raj Kumar Manala, Victor Govindaswamy

Institution: Concordia University Chicago

Email: crf_manalar@cuchicago.edu

Abstract:

SAND is a high-performance, C++-based system for real-time anomaly detection in continuous sensor data streams. It uses a custom linked list to maintain a dynamic sliding window of data and performs statistical analysis (moving average, standard deviation, rate of change) to identify anomalies. Key operations include traversal, search, sorting, reverse traversal, and cycle detection to ensure structural integrity.

Future Enhancements:

- **AI:** Predictive modeling and adaptive thresholding for intelligent anomaly classification
- **Blockchain:** Secure logging of anomalies and tamper-proof audit trails for sensor data

- **Quantum:** Ultra-fast pattern detection and optimization for high-throughput environments

37. BudgetWise: A C++-Based Personal Finance Tracker with Income and Expense Management

Author(s): Matias Zegarra, Victor Govindaswamy

Institution: Concordia University Chicago

Email: crf_zegarrms@cuchicago.edu

Abstract:

BudgetWise is a vector-based C++ system for managing income, expenses, and summaries. It features input validation and structured outputs.

Future enhancements:
- AI: Spending analysis
- Blockchain: Financial record integrity
- Quantum: Optimization algorithms

38. Design and Development of KOOL: Ensuring Secure Online Banking Transactions

Author(s): Wirata Korkitcharoenkul, Victor Govindaswamy

Institution: Concordia University Chicago

Email: crf_korkitw@cuchicago.edu

Abstract:

KOOL is a secure C++ banking app enabling users to manage deposits, withdrawals, and view balances. It integrates encryption and session validation.

Future Features:
- AI: Pattern-based fraud alerts
- Blockchain: Secure transaction integrity
- Quantum: Cryptography for next-gen banking

39. FINSYS: Financial Intelligence System for Your Savings – Powered by MySQL

Author(s): Manoj Kumar Narige, Victor Govindaswamy

Institution: Concordia University Chicago

Email: crf_narigem@cuchicago.edu

Abstract:

FINSYS is a MySQL-powered finance app to track income, expenses, and budgets using relational queries. It integrates ER modeling and normalization.

Planned Enhancements:
- AI: Personalized insights
- Blockchain: Secure ledgers
- Quantum: Data-intensive calculations

40. QIBA: A Quantum, Intelligent, Blockchain-Secured, Adaptive Quiz Application Using C++

Author(s): Rajendra Prasad Joshi, Victor Govindaswamy

Institution: Concordia University Chicago

Email: crf_joshir@cuchicago.edu

Abstract:

QIBA is a C++ adaptive quiz app that assesses user intelligence using menu-driven logic, scoring, and conditional pathways.

Future Enhancements:
- AI: Adaptive difficulty
- Blockchain: Secure certification
- Quantum: Real-time personalized questions

41 Beyond Agile: A Strategic Comparison of Scrum and Kanban for Modern Software Development and Project Management

Author(s): Rajendra Prasad Joshi, Victor Govindaswamy

Institution: Concordia University Chicago

Email: crf_joshir@cuchicago.edu

Abstract:

This project presents a strategic comparison between Scrum and Kanban, two dominant Agile frameworks used in software development. Scrum focuses on time-boxed sprints and well-defined roles for iterative delivery, while Kanban emphasizes continuous flow, visual task tracking, and flexibility. The presentation explores how leading tech companies adopt these frameworks and when hybrid approaches like Scrumban are most effective.

Future Enhancements:

- **AI:** Predictive sprint planning and intelligent backlog refinement
- **Blockchain:** Decentralized project tracking and milestone validation
- **Quantum:** Real-time sprint simulations and high-speed resource optimization

42. Beyond Agile: A Strategic Comparison of Scrum and Kanban for Modern Software Development

Author(s): Rajendra Prasad Joshi, Victor Govindaswamy

Institution: Concordia University Chicago

Email: crf_joshir@cuchicago.edu

Abstract:

This poster compares Scrum and Kanban, their structure, real-world use in tech companies, and hybrid models like Scrumban. It helps teams choose the best methodology.

Future of Agile:
- AI: Sprint planning automation
- Quantum: Ultra-fast iteration design
- Blockchain: Task audit trails

43. MyBC: Personalized Digital Platform for Metastatic Breast Cancer Patients

Author(s): Michael M. Haniff, Luis Nuñez

Institution: Precognitive Health & Concordia University Chicago

Email: luis.nunez@cuchicago.edu

Abstract:

MyBC is a mobile/web application for metastatic breast cancer patients, offering symptom tracking, wearable integration, provider messaging, and social determinant screening.

The platform uses ePRO modules, AI-driven decision support, HIPAA/GDPR compliance, FHIR interoperability, and serverless infrastructure for healthcare innovation.

44. MoneyVista: AI-Driven, Blockchain-Enabled, and Quantum-Ready Banking System

Author(s): Muhammad Waqas Sindhu, Victor Govindaswamy

Institution: Concordia University Chicago

Email: Waqas.sindhu181@gmail.com

Abstract:

MoneyVista is an advanced banking DBMS with Oracle SQL and JDBC for secure, scalable, and real-time financial operations. It supports cards, currency, transactions, investments, and compliance.

Future Expansion:
- AI: Anomaly detection
- Blockchain: Transparent audit trails
- Quantum: Cryptographic banking

45. TRAFFIC: Transportation Real-time Analytics, Forecasting, and Flow Information Control System

Author(s): Huda Bakr Baldawi, Victor Govindaswamy

Institution: Concordia University Chicago

Email: crf_bakrbahm@cuchicago.edu

Abstract:

TRAFFIC uses live sensor feeds, analytics, and forecasting to optimize freeway traffic flow, reduce congestion, and improve road safety. It incorporates ARIMA, IoT, and weather inputs.

Future Work:
- AI: Accident forecasting
- Blockchain: Sensor event logging
- Quantum: Optimization for smart city routing

46. EPMS: Enhanced Patient Management System with Future Prospects in AI, Quantum Computing, and Blockchain

Author(s): Anthony Espino, Victor Govindaswamy

Institution: Concordia University Chicago

Email: crf_espinoa6@cuchicago.edu

Abstract:

EPMS is a menu-driven C++ app for managing patient records with features like edit/delete/search. The enhanced version supports structured updates and real-time reviews.

Future Work:
- AI: Predictive diagnosis
- Blockchain: Secure records
- Quantum: Fast analytics for large datasets

47. Design and Implementation of SpendWise, a Smart Personal Assistant for Resourceful Quoting, using Agile Scrum Methodology

Author(s): Muhammad Ayan Hafeez, Victor Govindaswamy

Institution: Concordia University Chicago

Email: crf_hafeezm@cuchicago.edu

Abstract:

SpendWise is a mobile app for tracking expenses, visualizing spending, and managing budgets. Developed in React Native with Firebase backend, it supports real-time sync and graphical analysis.

Future Enhancements:
- AI: Budget predictions
- Blockchain: Verifiable logs
- Quantum: Financial simulations

48. VitalYou: Revolutionizing Health and Wellness Through Data-Driven Insights (Part 1)

Author(s): Dax Meyer, Victor Govindaswamy

Institution: Concordia University Chicago

Email: 24dbm02@gmail.com

Abstract:

VitalYou is a Kotlin-based wellness app for mood, habit, and health tracking. It includes analytics, goal setting, wearable sync, and predictive alerts.

Future Roadmap:
- AI: Wellness forecasting
- Blockchain: Secure health storage
- Quantum: Predictive diagnostics

49. VitalYou: Revolutionizing Health and Wellness Through Data-Driven Insights (Part 2)

Author(s): Dax Meyer, Victor Govindaswamy

Institution: Concordia University Chicago

Email: 24dbm02@gmail.com

Abstract:

Part 2 of the VitalYou project focuses on advanced tracking and API integration. Users receive personalized health reports, smart reminders, and visual summaries.

Future Enhancements:
- AI: Context-aware insights
- Blockchain: Health record authentication
- Quantum: Trend prediction from massive data

50. Design and Implementation of CLAIRE, an AI-Powered Home Organization, using Agile Scrum Methodology

Author(s): Thogaru Viharika, Victor Govindaswamy
Institution: Concordia University Chicago
Email: crf_thogarv@cuchicago.edu

Abstract:
CLAIRE (Clutter-free Living using AI, Innovation, Real-time organization, and Efficiency) is a smart home organization app that leverages AI, AR, and voice control to optimize space, automate task management, and promote collaborative home upkeep.

Future Enhancements:

- **AI:** Personalized organization and task scheduling
- **Blockchain:** Secure multi-user collaboration logs
- **Quantum:** Real-time optimization of spatial layouts

Speaker Biographies

Dr. Vladimiro Mujica

Institution: Arizona State University

Dr. Vladimiro Mujica earned his degree in Chemistry from the Central University of Venezuela in 1980 and a Ph.D. in Chemistry from Uppsala University in 1985. He completed postdoctoral research at Tel Aviv University and later served as a professor at the Central University of Venezuela. In 2005, he joined Northwestern University and Argonne National Laboratory as a Research Professor, eventually moving to Arizona State University in 2009, where he is now a Full Professor in the School of Molecular Sciences.

His research interests include quantum relaxation, molecular electronics, spintronics, nanophotonics, and quantum sensing. Dr. Mujica has authored over 200 peer-reviewed publications, with more than 10,000 citations (h-index 49), and has delivered over 200 invited talks globally. He is also a co-founder of IASOTEK, a nanotechnology startup. He has held visiting professorships at several prestigious institutions worldwide and is a member of the Latin American Academy of Sciences. He received the Lorenzo Mendoza-Fleury Science Prize in Venezuela in 2001.

Robert E. Johnson III, MS

Institution: Cimcor, Inc.

Robert Johnson is the co-founder and CEO of Cimcor, Inc., a cybersecurity firm known for its real-time file integrity monitoring and automated remediation software. He holds an Associate's Degree in Computer Programming, a B.S. in Systems Programming, and an M.S. in Management—all from Purdue University. He has also taught Operating System Internals at Purdue University Northwest.

Mr. Johnson is an inventor with several patents, a published author, and a frequent keynote speaker at conferences such as IEEE, CSI, and EnergySec. He has appeared on Bloomberg Radio and World Business Review and has been recognized in the Congressional Record for his contributions to innovation and security.

He actively serves on numerous advisory boards and foundations, including the Methodist Hospitals Board (current Chairman), Purdue University Northwest, and Valparaiso University. His accolades include induction into the NWI Times Business & Industry Hall of

Fame, Purdue Northwest Alumni Hall of Fame, and recognition as one of Indiana Business Journal's '250 Most Influential People in Indiana.'

Dr. Lorenzo Echevarria

Institution: Polytechnic University of Puerto Rico

Dr. Lorenzo Echevarria is a university and graduate-level professor with a Ph.D. in Chemistry from the Central University of Venezuela. He specializes in Physical Chemistry, particularly in Laser Spectroscopy and Quantum Chemistry. His academic research has included quantum chemistry calculations and nanomaterials, and he has contributed to several publications in the field.

Dr. Julio L. Palma

Institution: Penn State University, Fayette Campus

Dr. Julio Palma is an Associate Professor of Chemistry at Penn State Fayette. He earned his Ph.D. from the University of Florida and completed postdoctoral fellowships at Arizona State University's Biodesign Institute and at Yale University. His research focuses on theoretical and computational studies of electron transfer and charge transport at the molecular and nanoscale, with emphasis on molecular electronics, biosensing, and chiral-induced spin selectivity (CISS).

Dr. Vivian Janeth Santamaría García

Institution: Massachusetts Institute of Technology (MIT)

Dr. Santamaría García holds a Ph.D. in Nanotechnology from Tecnológico de Monterrey and has a background in biomedical engineering and manufacturing systems. She has conducted research at the Universitat Politècnica de Catalunya and Penn State University, and is currently a postdoctoral fellow in the Metamaterials Group at MIT.

Her research integrates first-principles simulations, nonlinear optics, and quantum transport to investigate light–matter interactions in low-dimensional materials. She has contributed to the development of materials for energy, healthcare, and sustainability and has collaborated on international projects in photonics, semiconductors, and functional materials.

Dr. Victor Govindaswamy

Institution: Concordia University Chicago

Dr. Victor Govindaswamy is a professor of Computer Science at Concordia University Chicago. His research areas include real-time distributed systems, software engineering, cybersecurity, telemedicine, and sustainable computing. He previously contributed to the DARPA- and NSWC-sponsored DeSiDeRaTa middleware project, which enabled dynamic real-time application execution with minimal code overhead.

He is the founder and director of CUC's Youth Robotics, Apps, and 3D Programming (RAP) Summer Camps and the CS4NE1 (STEM4NE1) mentoring initiative, aimed at promoting STEM education among middle and high school students.

Degrees:
- Ph.D., Computer Science and Engineering – University of Texas at Arlington
- M.S., Computer Science and Engineering – University of Texas at Arlington
- B.S., Electrical and Computer Engineering – University of Texas at Austin

Concordia University Chicago Campus Map

For attendees joining in person, here's the official campus map highlighting key locations:

- Koehneke Community Center (Building 13): In-Person Poster Sessions
- Christoper Center (Building 6): Online Presentations and Poster Sessions
- Chapel of Our Lord (Building 5): Venue for worship
- Geiseman Gymnasium (Building 11): Workout Facility

You can download the full campus map here:
👉 CUC Campus Map (PDF)

Moderators

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