

# Ryan Tufts, P.Eng. (AB 78780, BC 61452)

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## Summary

Hands-on AI automation developer and P.Eng. with 20+ years delivering industrial projects and building production internal tools. APEGA (78780); EGBC (61452)

Built Chirality App: a local-first desktop harness for AI agents that turns real filesystem work into permissioned, auditable workflows with structured outputs, validation, and reliable iteration.

My work: <https://www.chirality.ai> | <https://www.github.com/sgttomas/chirality-app>

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## Core Competencies

- AI automation: LLM API integration (Anthropic Claude Agent SDK), tool calling, prompt and context management, structured outputs
- Reliability techniques: validation, deterministic artifacts, provenance, explicit conflict surfacing, safe permissions and error handling
- Full-stack delivery: TypeScript and Node.js, Next.js API routes, React UI, Electron desktop packaging; SSE streaming event pipelines
- Data and models: schema-first CSV and JSON registers, dependency DAG and knowledge graph edges, filesystem-as-state session persistence
- Engineering domain: industrial project delivery, commissioning and turnarounds, regulatory interfaces (ABSA and TSBC), stakeholder management

## Education

**B.Sc. Mechanical Engineering** (Co-op Program)

University of Alberta, Dec 2004

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## Highlighted Experience

### AI Automation Developer and Builder | Chirality App | 2025 - Present

- **Designed and built a desktop harness to run AI agents** against a user-selected working folder (filesystem-as-state; no separate database or server).
- **Implemented a production runtime:** session persistence, streaming SSE UI events, tool permissions, model and prompt context loading, structured logs and artifacts.
- **Built workflow scaffolding for deliverable-heavy work:** decomposition-driven structure, lifecycle states, dependency extraction to Dependencies.csv, aggregation and reconciliation tool roots.
- **Added validation automation to prevent regressions** in permissions, interruption behavior, session persistence, and artifact contracts.

## Project Engineer (Acting Process and Mechanical Lead) | FWS | Apr 2024 - Oct 2025

- Delivered 30 engineering work packages on schedule for a 1MM tonnes/year transloading facility (DP World, Surrey, BC).
- Owned scope and deliverable review for contract compliance; coordinated engineering, procurement, vendors, and construction priorities.
- Completed hydraulic calculations, equipment sizing, P&IDs, process narrative, shutdown key, and instrument list ranges when stepping in mid-project.
- Managed TSBC interface for a marine loading arm and supported commissioning through handover, including custody-transfer flowmeters.

## Reliability Engineer (Static Equipment) | BP Cherry Point Refinery | Sep 2017 - Aug 2019

- Developed and managed work scopes during two major turnarounds (2018 and 2019), including repair packages, tie-ins, and field support.
- Engineered piping and vessel repairs and installs to ASME, API, and NBIC; reviewed vendor drawings and calculations.
- Built a corrosion prediction algorithm to augment RBI workflows (API RP 580) and supported fitness-for-service and damage mechanism reviews.
- Designed and stress-analyzed hydrogen service piping (API RP 941), supporting fabrication and field implementation.

## Facility Operations Engineer | Plains Midstream Canada | Jan 2016 - Sep 2017

- Owned engineering work requests for an NGL straddle plant and pipeline system; delivered brownfield modifications with operations alignment.
- Restored 2-3% NGL recovery by diagnosing process interactions and implementing piping and procedure changes.
- Scoped terminal expansion and a truck loading rack project (approx. CAD 15MM), including tankage, pumps, vessels, piping, and controls.

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## Technical Proficiencies

**AI and Automation:** Anthropic Claude (Agent SDK), prompt orchestration, tool calling, structured outputs, validation and guardrails

**Backend:** Node.js, Next.js (REST APIs and SSE), filesystem persistence (JSON and CSV), basic Python scripting

**Frontend:** TypeScript, React, Next.js, Electron

**Dev and Release:** Git, GitHub Actions, npm, electron-builder; Docker (basic)

**Data:** schema-first registers, provenance tracking, dependency DAG and knowledge graph edges; relational and vector database concepts (familiar)