Ahmad Salehiyan

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Stillwater, OK | Oklahoma State University

Summary

PhD researcher in Industrial Engineering specializing in **optimization and scheduling** under uncertainty. Experience designing **POMDP/MDP** policies, **stochastic dynamic programming**, and **MIP/LP** models for maintenance planning and operations. Strong in algorithm design (control-limit policies, bias/average-cost methods), simulation, and decision support with Python/Julia/GAMS.

Core Technical Skills

- **Optimization & OR:** MIP/LP, network optimization, decomposition (Benders, Lagrangian), constraint modeling, resource-constrained scheduling
- **Stochastic Control:** MDP/POMDP modeling, value/policy iteration, control-limit design, reliability modeling, Monte Carlo simulation
- **Tooling:** Python (NumPy, SciPy, pandas), Julia, R, GAMS, (exposure) Pyomo; Git, LaTeX; SQL/PostgreSQL
- **Analytics:** Time-series feature extraction for condition monitoring, clustering for state aggregation, experiment design

Education

- **Oklahoma State University**
  Ph.D., Industrial Engineering and Management (Expected 2028) *Advisor: Dr. Akash Deep*
  - Research: Maintenance planning with multi-sensor signals, **POMDP** policies with control limits, risk-aware operating vs. PM decisions.
- **Oklahoma State University**
  M.S., Applied Statistics *Expected Graduation: 2026*
  - Focus: Experimental data analysis, statistical programming in R/SAS, analytics, design of experiments.
  - Coursework: DOE, Mathematical Statistics, Statistical Programming (R/SAS), Applied Analytics.
- **K. N. Toosi University of Technology**
  M.S., Industrial Engineering (2019–2022) *Advisor: Dr. Abdollah Aghaie*
  - Thesis: *Predictive Maintenance of Advanced Industrial Machines Using AI Techniques*.
- **Islamic Azad University (Qazvin)**
  B.S., Industrial Engineering (2014–2019)

Experience

- **Graduate Research Assistant — Oklahoma State University** Aug 2023 – Present
  - Designed a **POMDP-based** framework for condition-based maintenance using multiple sensor streams; derived **control-limit** policies and evaluated against operate vs. PM baselines.
  - Built simulation to estimate long-run average cost and risk (e.g., VaR/CVaR) for maintenance decisions; analyzed sensitivity to sensor noise and policy thresholds.
  - Implemented small-scale **MIP** formulations for scheduling preventive actions under resource constraints; compared to heuristic policies.
- **Research Assistant — K. N. Toosi University of Technology** Oct 2018 – Apr 2020
  - Applied optimization-aware feature engineering for **early fault detection**; used model outputs to inform maintenance scheduling rules.
- **Industrial Engineer — Karin Crane Company** Apr 2019 – Oct 2019
  - Coordinated process improvements and documented workflows; supported resource planning and quality control across teams.

Optimization & Scheduling Projects

- **Multi-Sensor Maintenance Policy (POMDP)** — State aggregation + belief updates; designed *operate vs. PM* **control-limit** policies minimizing long-run average cost with simulation-based evaluation.

- **Preventive Maintenance Scheduling (MIP)** — Resource-constrained PM scheduling across units; compared exact MIP vs. greedy heuristics; analyzed trade-offs under technician/time-window limits.
- **Aisle-Level DP to Global Policy** — Ran subset DP on 1-D aisle abstractions to compute exact travel/transition costs, then composed results into a global control strategy for routing/scheduling.

Publications & Manuscripts

- **A Multi-Agent Framework for Scalable Fleet Maintenance Planning under System Constraints**. In preparation, 2025. (with Akash Deep)
- **POMDP-based Optimal Maintenance Planning Using Multiple Sensor Signals**. *Manuscript submitted*, 2024.

Talks & Conference Presentations

- **A Scalable Algorithm for Condition-Based Maintenance with High-Dimensional Sensor Data**. *INFORMS Annual Conference*, 2024 (Talk); *RAMS*, 2025 (Poster).
- **Disease Cluster Analysis in EHR**. *IISE Annual Conference & Expo*, 2025 (Talk) — includes scheduling/operations implications for cohort monitoring.
- **POMDP-based Optimal Maintenance Planning Using Multiple Sensor Signals**. *OSU Student Research Symposium*, 2024 (Poster; 3rd Place).

Professional Memberships

- **INFORMS** — Member (since 2024)
- **IISE & IISE Reliability & Maintenance Society** — Member (since 2024)
- **SME (Society of Manufacturing Engineers)** — Member

Honors & Awards

- **3rd Place**, OSU Student Research Symposium (Graduate Poster), 2024
- Ranked **9th** among M.Sc. Systems Optimization cohort, 2021
- Ranked **4th** among B.Sc. Industrial Engineering cohort, 2017

Languages

- Persian (Native/Bilingual), English (Full Professional)