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Objective: *AI, Search, and Data Executive*
Publications: smartinfer.com/publication/academic_publications.html
Essays: smartinfer.com/technical_articles/index.html
Patents: smartinfer.com/patents/index.html

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Executive Summary

Accomplished AI and Engineering Leader with 20+ years of experience building 0-to-1 products across enterprise and consumer platforms. Proven expertise in generative AI, NLP, computer vision, and large-scale search and recommendation systems. Experienced in leading foundational model research, multimodal AI, and reinforcement learning initiatives at enterprise scale, with hands-on expertise across the full LLM lifecycle—data creation, training, evaluation, and inference optimization. Skilled at leading cross-functional teams to deliver innovation at scale, drive measurable business outcomes, and build lasting competitive advantage. Deep understanding of hardware–software interfaces, model distillation, and cost-efficient inference architectures.

Key Achievements

- **LLMs for Microsoft PowerPoint (2024–Present):** Led design and development of prompt-based AI systems and fine-tuned large language and reasoning models for grounded, on-brand slide creation and document understanding—doubling user engagement. Built applications leveraging image generation models for visual slide content. Founded and scaled the AI and Data teams for Microsoft PowerPoint; led AI development and hiring strategy across the Office group.

- **ML, DL, and LLMs at Adobe (2019–2023):** Developed semantic parsing for PDFs; implemented a model-distillation framework for fast and cheap object detection, built RAG systems for summarization and Q&A (Acrobat Assist). Enhanced Adobe Stock image search recall and diversity via CLIP-based models and a k-sparse autoencoder; architected an AI-powered audience discovery platform (Segment AI).

- **ML and DL at Salesforce (2016–2019):** Launched recommender systems, spam detection, Q&A features, chatbots, enterprise search, and news feed ranking for Community and Service Cloud—achieving a 20%+ engagement lift; accelerated AI adoption with BERT and Transformer-based solutions.

- **Commerce Search at Walmart (2014–2015):** Led 80+ engineers and scientists to build ML-based ranking/recall models, query understanding systems, Markov model–based spell correction, and ML-based type-ahead systems from scratch—boosting revenue by 23% and sales by 17%.

- **Recommender Systems for UpWork (2013–2014):** Built an end-to-end, near real-time contractor recommender system (hiring rates +4%); established a product analytics team and built an experimentation platform, contributing to M&A due diligence.

- **Commerce Search at eBay & Amazon (Earlier Career):** Transitioned eBay to the ML-based Cassini search platform (+6% revenue) by architecting Cassini's ranking module and an image-search system for fashion; at Amazon A9, developed global ranking infrastructure and implemented new relevance evaluation systems.

Areas of Expertise

- **AI, ML, and Information Retrieval:** Developing generative AI systems, large language models (LLMs), NLP, computer vision, recommendation systems, and scalable search architectures.

- **AI Strategy & Execution:** Defining and leading AI roadmaps, transforming cutting-edge research into scalable products, and driving measurable business impact.

- **AI Systems Architecture:** Designing high-performance, cost-efficient platforms for AI, search, and data with a focus on integration, evaluation, and operational excellence.

- **Leadership, Ethics & Innovation:** Building high-performing AI teams, advancing responsible AI practices, and aligning applied science with strategic product outcomes.

Professional Experience

Head of AI and Data, Microsoft PowerPoint   *March 2024 – Present*

- Led enterprise adoption of AI-driven presentation generation through PowerPoint Copilot, integrating foundation models and multimodal AI into production.

- Built cross-functional applied science organization delivering measurable improvements in generative quality, latency, and grounded accuracy.

- Defined and executed the AI and data strategy for PowerPoint and the broader Office group—developing fine-tuned multi-modal LLMs for slide generation, reference-based design transformation, image slide generation, and structured Office XML creation.

- Architected Copilot systems (e.g., narrative builder) to generate presentations from user input and documents, leading to a 20% increase in engagement. Supported key features including rewrite, translation, speaker notes, and summarization.

- Additionally led applied research initiatives advancing Copilot capabilities:
  - Developed an **agentic AI system** for PowerPoint editing and generation, integrating Autogen- and Semantic Kernel-based orchestration for multi-tool reasoning and adaptive workflows.
  - Introduced **reinforcement learning–based aesthetic optimization** for slide layouts and design elements, improving perceived quality and visual balance through user feedback loops.
  - Built **on-brand grounded slide deck generation** integrating text and **image generation models**, enabling consistent style, brand alignment, and visual relevance for enterprise users.

- Built and scaled a cross-functional applied science and data organization from 1 to 16 by hiring top AI and data science talents, spanning model development, evaluation, analytics, and data labeling; established foundational programs for synthetic data and quality instrumentation.

- Mentored emerging AI leaders and designed internal training on fine-tuning and evaluation; influenced Office-wide AI hiring strategy and served on Responsible AI and deployment safety committees.

- Partnered with Office LT and Microsoft Research to shape long-term AI investments, foundation model strategy, and applied science priorities across the productivity suite.

Founder, AI Startup   *Sept 2023 – Feb 2024*

- Founded and prototyped a GPT-powered healthcare app to improve patient education, with a nonprofit-focused launch planned for 2025.

Director of Machine Learning & Engineering, Adobe   *July 2019 – May 2023*

- Oversaw a 40–60 person cross-functional ML organization delivering AI innovations for Adobe Sign, Acrobat, Stock, Creative Cloud, and the Experience Platform; specialized in generative AI, computer vision, NLP, recommendation systems, and audio/video optimization.

- Drove major improvements in form-field detection (Adobe Sign), PDF viewing (Acrobat iOS liquid mode), and multilingual layouts (Adobe Express) via an enhanced document-structure model; managed a team that developed compact models for mobile devices, resulting in a $3\times$ increase in form-detection efficiency, support for 15+ languages, and reduced iOS failure rates.

- Developed privacy-preserving embeddings for customer-facing ML systems (in collaboration with legal teams on GDPR/CCPA) and led data-stitching frameworks to create 360° customer profiles.

- Introduced Q&A, summarization, and highlights for Acrobat using retrieval-augmented generation; deployed a privacy-centric AI pipeline on Azure to accelerate document intelligence feature development.

- Led and drove the research on Legal and contract document understanding for Acrobat.

- Built an ML-based ranking framework for Adobe Stock and Creative Cloud's recommendation systems; created a semantic text-to-image search using multi-modal CLIP embeddings and a k-sparse autoencoder to improve recall and search diversity.

- Launched an advanced audience discovery platform with segmentation, fast nearest-neighbor techniques, and scalable clustering; cut operational costs by $4\times$ through pipeline simplification and parallelization-driven improvements; redesigned the UX based on marketer feedback, earning strong pilot customer praise.

Director of Machine Learning & Engineering, Salesforce
July 2016 – July 2019

- Directed a 40+ person ML organization across the US, EU, and Asia, delivering AI-driven features that enhanced user engagement in Community Cloud and improved enterprise onboarding in Service Cloud; oversaw model design, data pipelines, deployment strategies, and cross-functional partnerships.

- Launched recommendation systems, spam detection, Q&A features, chatbots, enterprise search, and ML-based feed ranking—achieving a 20% boost in engagement and broader AI adoption.

- Collaborated with ethics committees to ensure GDPR/CCPA compliance and led security reviews for community and service data flows.

- Developed BERT-powered chatbots and dialogue recommendation systems for retail, banking, and hospitality, significantly increasing accuracy and adoption.

Founder & Managing Consultant, SmartInfer LLC
2015 – 2019

- Advised Etsy on search analytics, machine-learned spell correction, and AI organization design across two locations.

- Boosted Neurotrack's Alzheimer's diagnostic accuracy by 20% through improved pupil-tracking algorithms.

Director of Search Science, Walmart E-commerce
June 2014 – Oct 2015

- Led a 16-month AI transformation with 80+ staff, creating an analytics team to address search inefficiencies in demand/supply; mapped key business problems to ML solutions including multi-layer ranking, query understanding, smart promotions, and specialized search for tires/pharmacy—achieving 23% revenue growth and 17% sales uplift.

- Streamlined recruitment and forged university partnerships, scaling R&D at the Bangalore center.

Director, Data Science and Engineering, Elance/UpWork
June 2013 – June 2014

- Built a contractor ranking and recommender system from scratch, increasing hiring rates by 4%.

- Created a controlled experimentation platform for data-driven improvements, supporting Elance's transition to UpWork.

Early Career (2005 – 2013):

Roles at eBay, Amazon A9, Microsoft, and MyFamily/Ancestry

- Contributed to ML-based ranking (Cassini, +6% revenue), image-search pipelines, indexing and crawling in C++, and OCR error correction models.

Research & Technical Leadership

- Defined scientific roadmaps for fine-tuning and evaluation of multimodal foundation models in enterprise contexts.

- Developed and deployed agentic AI systems using Autogen, Semantic Kernel, and LangChain for dynamic reasoning and multi-tool orchestration in production applications.

- Contributed essays on reasoning models, inference-time scaling, and AI safety (SmartInfer Technical Articles).

Education

- **Ph.D. in Computer Science,** University of California, Davis (2018) – AI, Distributed Systems

- **Executive Education,** University of California, Berkeley (2018) – Negotiation and High Performance Leadership

- **M.S. in Computer Science,** Ohio State University (2005) – Distributed Data Mining

- **M.S. in Computer Science,** University of South Florida (2002) – Computer Vision and Graphics

- **M.Tech in Mechanical Engineering,** IIT Kanpur (1999) – Robot Vision & Planning

- **B.E. in Mechanical Engineering,** West Bengal (1996)

Selected Patents and Publications

- **Patents:**

  - Service Agent Personal Recommender System (US 1020369)
  - Image-based Popularity Prediction (US 20120303615)
  - Query Classification for Improved Search Relevance (US 20120221557)

- **Publications:**

  - Doctoral Thesis: *Machine-Learned Ranking Algorithms for E-commerce Search and Recommendation Applications.*
  - IEEE Big Data (2015): *Controlled Experiments for Decision-making in E-commerce Search*
  - SIGIR ECOM (2018): *Towards Optimization of E-Commerce Search and Discovery.*
  - Master's Thesis (2005): *Efficient Clustering Algorithms for Out of Core, Distributed and Streaming Data*

Selected Awards and Recognitions

- Conference Reviewer (SIGIR, KDD, EMNLP), Speaker/Panelist (AI, ML, E-commerce), and UC Davis Graduate Fellowship recipient.