AI Trends and Trials

Hands-On Workshop

Oakland East Bay-Life Member Affinity Group (OEB-LMAG)

January 22, 2025

Welcome from your Board Officers

- **Maureen Vavra – Chair**

- **Mickey Mantle – Vice Chair**

- **Larry Moon – Secretary**

- **Karl Yang – Finance**

   We continue to build our IEEE Life Member community and plan to continue to hold live (and live/virtual when appropriate) meetings like this hands-on workshop. Mark your calendars, and plan on a meeting the 3rd Wednesday of the 1st month of every quarter.

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We Need Your Help and Participation

- **IEEE has rules regarding how a Life Member Affinity Group should operate**

- **Officers are limited to 2-year terms**

- **Some of our officers should be retiring**

- **We need volunteers to get involved and become part of the Board**

Life Members with a few hours each quarter to spare should consider becoming a Board Member. This is an opportunity to learn more about your fellow IEEE Life Members, make new friends, and help others!

If you are interested, please let one of the Board members know or send an email to: MWVavra@outlook.com

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Before We Start – A Quick Survey
(a show of hands for each question please!)

1. How many here are IEEE Life Members?

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1. How many here are IEEE Life Members?

2. How many know the history of AI developments?
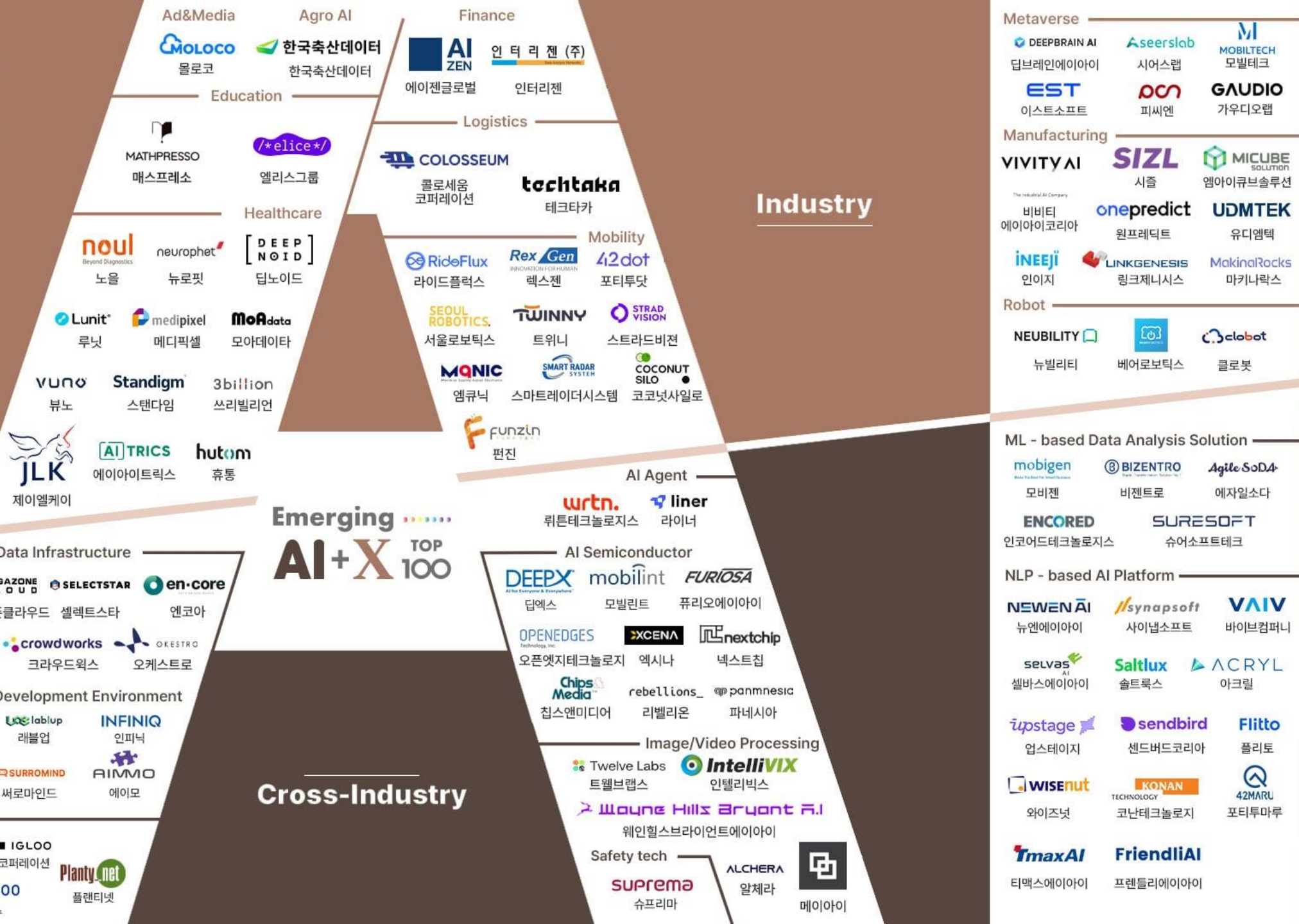
Before We Start – A Quick Survey
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1. How many here are IEEE Life Members?

2. How many know the history of AI developments?

3. **How many have concerns about the rapid rise of AI capabilities?**

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4. **How many are excited about the rapid rise of AI applications?**

Before We Start – A Quick Survey
(a show of hands for each question please!)

1. How many here are IEEE Life Members?

2. How many know the history of AI developments?

3. How many have concerns about the rapid rise of AI capabilities?

4. How many are excited about the rapid rise of AI applications?

5. How many have tried using any of the popular AI applications?

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한국인공지능산업협회
Artificial Intelligence Industry Association
2025 Emerging AI+X Top100

Industry

Cross-Industry

Emerging AI+X TOP100

Ad&Media
- MOLOCO 몰로코
- 한국축산데이터 한국축산데이터 (Agro AI)

Finance
- AIZEN 에이젠글로벌
- 인터리젠(주) 인터리젠

Education
- MATHPRESSO 매스프레소
- /*elice*/ 엘리스그룹

Healthcare
- noul Beyond Diagnostics 노을
- neurophet 뉴로핏
- DEEP NOID 딥노이드
- Lunit 루닛
- medipixel 메디픽셀
- MoAdata 모아데이타
- VUNO 뷰노
- Standigm 스탠다임
- 3billion 쓰리빌리언
- JLK 제이엘케이
- AI TRICS 에이아이트릭스
- hutom 휴톰

Logistics
- COLOSSEUM 콜로세움 코퍼레이션
- techtaka 테크타카

Mobility
- RideFlux 라이드플럭스
- Rex Gen INNOVATION FOR HUMAN 렉스젠
- 42dot 포티투닷
- SEOUL ROBOTICS 서울로보틱스
- TWINNY 트위니
- STRAD VISION 스트라드비젼
- MQNIC 엠큐닉
- SMART RADAR SYSTEM 스마트레이더시스템
- COCONUT SILO 코코넛사일로
- Funzin 펀진

AI Agent
- wrtn. 뤼튼테크놀로지스
- liner 라이너

AI Data Infrastructure
- MEGAZONE CLOUD 메가존클라우드
- SELECTSTAR 셀렉트스타
- en·core 엔코아
- exem 엑셈
- crowdworks 크라우드웍스
- OKESTRO 오케스트로

AI Development Environment
- NEUROCLE 뉴로클
- lablup 래블업
- INFINIQ 인피닉
- MOREH 모레
- SURROMIND 써로마인드
- AIMMO 에이모

Cybersecurity
- openbase 오픈베이스
- IGLOO 이글루코퍼레이션
- Planty net 플랜티넷
- JASON an AhnLab Company 제이슨
- FASOO 파수

AI Semiconductor
- DEEPX AI for Everyone & Everywhere 딥엑스
- mobilint 모빌린트
- FURIOSA 퓨리오에이아이
- OPENEDGES Technology, Inc. 오픈엣지테크놀로지
- XCENA 엑시나
- nextchip 넥스트칩
- Chips&Media 칩스앤미디어
- rebellions_ 리벨리온
- panmnesia 파네시아

Image/Video Processing
- Twelve Labs 트웰브랩스
- IntelliVIX 인텔리빅스
- Wayne Hills Bryant A.I 웨인힐스브라이언트에이아이

Safety tech
- suprema 슈프리마
- ALCHERA 알체라
- 메이아이

Metaverse
- DEEPBRAIN AI 딥브레인에이아이
- seerslab 시어스랩
- MOBILTECH 모빌테크
- EST 이스트소프트
- pcn 피씨엔
- GAUDIO 가우디오랩

Manufacturing
- VIVITY AI The Industrial AI Company 비비티에이아이코리아
- SIZL 시즐
- MICUBE SOLUTION 엠아이큐브솔루션
- onepredict 원프레딕트
- UDMTEK 유디엠텍
- iNEEJi 인이지
- LINKGENESIS 링크제니시스
- MakinaRocks 마키나락스

Robot
- NEUBILITY 뉴빌리티
- 베어로보틱스
- clobot 클로봇

ML - based Data Analysis Solution
- mobigen 모비젠
- BIZENTRO 비젠트로
- Agile SoDA 에자일소다
- ENCORED 인코어드테크놀로지스
- SURESOFT 슈어소프트테크

NLP - based AI Platform
- NEWEN AI 뉴엔에이아이
- synapsoft 사이냅소프트
- VAIV 바이브컴퍼니
- selvas AI 셀바스에이아이
- Saltlux 솔트룩스
- ACRYL 아크릴
- upstage 업스테이지
- sendbird 센드버드코리아
- Flitto 플리토
- WISEnut 와이즈넛
- KONAN TECHNOLOGY 코난테크놀로지
- 42MARU 포티투마루
- TmaxAI 티맥스에이아이
- FriendliAI 프렌들리에이아이

A Brief History of AI

Marvin Minsky, who joined MIT in 1958, was a pioneering figure in AI. Along with John McCarthy, he co-founded MIT's AI Laboratory in 1959. Minsky's early work focused on computational theories of intelligence and learning. His 1969 book "Perceptrons" with Seymour Papert analyzed artificial neural networks, though its critique temporarily slowed neural network research.

Key developments followed:

1960s: Early natural language processing programs like ELIZA emerged. McCarthy developed the LISP programming language, crucial for early AI.

1970s: Expert systems gained prominence, with DENDRAL and MYCIN showing AI could match human expertise in specific domains.

1980s: Neural networks resurged with backpropagation algorithms. Companies began commercializing AI through expert systems, though limitations led to an "AI winter."

1990s-2000s: Machine learning gained momentum. IBM's Deep Blue defeated chess champion Garry Kasparov in 1997. The rise of big data and improved computing power enabled practical applications.

2010s: Deep learning breakthroughs transformed AI. Key milestones included:
- ImageNet competition victories using deep neural networks
- Google DeepMind's AlphaGo defeating Go champion Lee Sedol
- Significant advances in natural language processing with models like BERT

2020s: Large language models like GPT series marked major advances in natural language understanding and generation. AI applications expanded across industries, from healthcare to autonomous vehicles.

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Key AI Acronyms

AI - Artificial Intelligence: Systems designed to mimic human intelligence

ML - Machine Learning: Systems that learn from data

DL - Deep Learning: Complex neural networks with multiple layers

NLP - Natural Language Processing: AI systems working with human language

CNN - Convolutional Neural Network: Neural networks specialized for visual data

RNN - Recurrent Neural Network: Neural networks that handle sequential data

LLM - Large Language Model: AI systems trained on vast text datasets

AGI - Artificial General Intelligence: Hypothetical AI matching human-level cognition across all domains

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Key AI Definitions

- **Neural Network:** Computing system inspired by biological brains

- **Dataset:** Collection of information used to train AI systems

- **Model:** The trained system that makes predictions or decisions

- **Parameters:** Variables the model adjusts during training

- **Features:** Individual measurable properties used as input

- **Bias:** Systematic errors or unfairness in model outputs

- **Inference:** Process of making predictions using a trained model

- **Transformer:** Architecture type used in modern language models

- **Attention:** Mechanism allowing models to focus on relevant information

- **Hallucination:** When an artificial intelligence system generates or outputs information that is false, inaccurate, or entirely fabricated, despite appearing confident and coherent

AI – a unique type of technological revolution due to its:

1. Unprecedented speed of development and adoption

2. Breadth of impact across all sectors

3. Potential to augment and possibly rival human cognitive abilities

4. Capacity for self-improvement

Economic Challenges and Adaptations

1. **Job Market Changes**
   - Some routine cognitive tasks will be automated
   - New roles will emerge combining human expertise with AI capabilities
   - Emphasis on skills AI can't easily replicate: creativity, emotional intelligence, complex problem-solving
   - complex problem-solving
   - Growing importance of continuous learning and adaptation

2. **Income Potential**
   - Higher wages for AI-literate professionals
   - New revenue streams from AI-enhanced services
   - Potential for smaller teams to compete with larger organizations
   - Opportunities in AI training and implementation

3. **Skill Development Strategy**
   - Focus on complementary skills rather than competing with AI
   - Develop expertise in human-AI collaboration
   - Build strong interpersonal and leadership abilities
   - Maintain adaptability and learning capacity

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Immediate Opportunities of AI are Significant for Individuals

1. **AI-Adjacent Skills**
   - Learning to prompt and work with AI tools effectively
   - Data analysis and interpretation
   - AI project management
   - AI ethics and governance roles
   - AI training and education positions

2. **Industry-Specific AI Integration**
   - Healthcare: AI diagnostic tools, patient care optimization
   - Finance: AI-driven analysis, algorithmic trading
   - Education: Personalized learning systems
   - Marketing: AI-powered customer analytics
   - Legal: AI document analysis, research automation

3. **Entrepreneurial Opportunities**
   - Building AI-powered products and services
   - Creating industry-specific AI solutions
   - Developing AI training programs
   - Consulting on AI implementation
   - Creating AI-human workflow optimizations

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Most Popular AI Applications

Top Chatbots:
- **ChatGPT:** The undisputed leader with 200 million users as of October 2024
- **Copilot (formerly Bing Chat):** Microsoft's versatile AI assistant
- **Claude:** A strong competitor to **ChatGPT**
- **Gemini:** Google's AI chatbot for Android and iOS

Emerging Popular Apps:
- **Perplexity:** Ranked #3 on the web with high user engagement
- **Character.ai:** Popular in unique monthly visits
- **Microsoft Edge:** Top in active monthly users
- **Suno:** A rising music generation app

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Most Popular AI Applications

- **The best AI productivity tools by category**
- Chatbots ([ChatGPT](), [Claude](), [Meta AI](), [Zapier Agents]())
- Search engines ([Perplexity](), [Google AI Overviews](), [Arc Search]())
- Content creation ([Jasper](), [Anyword](), [Writer]())
- Grammar checkers and rewording tools ([Grammarly](), [Wordtune](), [ProWritingAid]())
- Video creation and editing ([Runway](), [Descript](), [Wondershare Filmora]())
- Image generation ([DALL·E 3](), [Midjourney](), [Ideogram]())
- Social media management ([FeedHive](), [Vista Social](), [Buffer]())
- Voice and music generation ([ElevenLabs](), [Suno](), [AIVA]())
- Knowledge management and AI grounding ([Mem](), [Notion AI Q&A](), [Personal AI]())
- Task and project management ([Asana](), [Any.do](), [BeeDone]())
- Transcription and meeting assistants ([Fireflies](), [Avoma](), [tl;dv]())
- Scheduling ([Reclaim](), [Clockwise](), [Motion]())
- Email ([Shortwave](), [Microsoft Copilot Pro for Outlook](), [Gemini for Gmail]())
- Slide decks and presentations ([Tome](), [Beautiful.ai](), [Slidesgo]())
- Resume builders ([Teal](), [Enhancv](), [Kickresume]())
- Automation ([Zapier]())
- [Other AI productivity tools]()

AI Applications to Try TODAY!

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AI Resources for You

Download from: https://tinyurl_OEBLM-AI

Thank you for being taking the time to be part of our IEEE OEB-LMAG AI Hands-on Workshop!

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