Diving into generative-AI to Assess its Current Status

Coordinator: Prof. Dr. Petre Dini, IARIA, USA/EU

petre@iaria.org
https://www.iaria.org/fellows/PetreDiniAtAGlance.pdf

IARIA is member of ORCiD
Sudden Planetary Storm
Valencia
November 2023

King Charles: AI risks require urgency and unity
King enters debate on AI as UK holds summit and announces global declaration on managing threats.

US announces 'strongest action yet' on AI safety
The measures have been issued less than 48 hours before the UK hosts an AI safety summit.

Germany invests millions into AI military metaverse that could never change combat

Is AI a blessing or a curse? Barcode developer says it could go either way

Apple CEO sings AI praises on rare visit to ruined WW2

China warns of artificial intelligence risks, calls for increased national security measures

CEO warns of 'very strange outcomes' from new tech with 'superhuman' skills

Terrible things in store if Washington doesn't act on AI race, tech ethicist warns

Society & Equity
US to launch its own AI safety institute

Security game-changer for concerts, sporting events that will get you inside faster

LinkedIn hits 1 billion members, adds AI features for job seekers

Disrupted
Before anything...

- **I acknowledge** that generative-AI is a useful approach for certain activities/duties, not necessarily ‘artificial’, but definitively, not ‘intelligent’, either; it seems a useful tool on a narrative in context, without any innovation in that context.
  
  **YET:** multilingual narrative translation: I’ve seen que tu peux gerer istorii in mai multe limbi” → “Ho visto che puoi gestire storie in diverse lingue.”

- **There are many areas and themes** where output from generative-AI tools might be useful, when carefully considered:
  
  - drafting some content (yet to be combed by humans) on a given topic; a reasonable summary on a topic, quick reply,
  - coding chunks, multiple programming languages, ... providing useful classroom personalized materials
  - making trip/travel plans in certain areas, saving time, pointing to things you might not be aware-off
  - others (situation on new nano-art, position ethics,... ); very useful at the level of being informed; very promptly!

- **As of Nov 13, 2023, my observations** are that:
  
  - the output replicates (quicker, more comprehensible) what a human can do, usually called ‘automation’
  - the output is subject of unintended (not easily detectable) mistakes issued with confidence
  - the trust in the output (apart you have a clear understanding of expectation) is jeopardized by the nature of data used (not-validated, eventually obsolete, incomplete, not scientific)
  - there is a danger of spreading false information (and news, facts)
  - there is no accountability, liability, explainability of the output

- **Generative-AI is a fledgling piece in the AI jigsaw**, useful in trivial cases, mostly informative, but its output cannot be taken as a proved and trustable fact || (try-test-trust-test-again-try-again and so forth, until you loose trust or get confidence)
PETRE – AI-related activities

• Petre: 1980/90
  - Fuzzy-based resource allocation, Automatic knowledge incorporation, CAD/CAM Expert Systems,
  - Real-time embedded systems, Space/time thinking and processing, Multi-layers context-based meaning
• Petre: 1992: The First ITC Conference (Montreal), tutoring systems, self-adaptable Q&A professor-student systems (advanced Chatbots)
• Petre: 1997 Dartmouth, Mobile Intelligent Agents (Intelligent Grasshopping Polling)
• Petre: 1997-2000: Nomadic code, Mobile agents, (Grasshopper EU project)
• Petre: 2000-2010: Autonomous systems, Policy-driven systems, Intelligent systems (pushed to Patents, ITU, TMF, standards)
  - Capturing emerging properties, Variable pooling frequency, Self-adaptable decision polices, Reflexive-policies (Digital-Twins)
  - Routers embedded-AI (temporal logic in Syslog processing, policy-driven signal processing)
• Petre: 2010 - now (active observer and critic, panels, open discussions)

At large: http://www.iaria.org/fellows/PetreDini.pdf
AI does not exist in itself! (Ignorance, Arrogance, or Charlatanism)

AI is a parable, an umbrella, a target, a catalyzer, a Morgan the Fairy, an Accelerator, a distant dream, a fight for perfection, to reach the humans’ intelligence capabilities.

Steam-engines, pencils, wind propellers, there were ALL steps of inventions towards AI (EXPERIMENTS are imperative)

a. Can you imagine any AI entity thinking at a pencil, by itself, finding needed materials, shipping them, building the process, building the machinery, finding the glue, the powder, and having it in various types (more than 600 activities)

b. Same question on simply building a wind propeller pallet, a church, or proposing a recipe. (each item takes a human collective thinking approach)

c. One may think at ANYTHING and the above statement holds; and this, because everything involves brain activity.

As dreams are not easy to be achieved, humans invented satisfactory levels, for their own comfort (as life is short, we should be proud of something, 😊); mainly, the famous ‘one step at a time’. 😊 currently, we are at the very beginning of the first step!

There are:
- 5 Levels of Capability Maturity Models (software), as there were/are well too many software failures
- 5 Levels for automation on Driverless Cars, as well to many failures and challenges (to claim one step ahead)
- 3 Levels of Chargers for Electric Cars
and ...... surprise
- (at least) 4 levels of AI capabilities, as of Nov 13, 2023; some, name 7, already; [https://builtin.com/artificial-intelligence/types-of-artificial-intelligence](https://builtin.com/artificial-intelligence/types-of-artificial-intelligence)

**Generative-AI** is the very first (still, sloppy achievement) and at a very low level of AI-dream (that is as much as we can, now).
AI Dream - Strong Evidence

LEVELS OF DRIVING AUTOMATION

0. NO AUTOMATION
Manual control. The human performs all driving tasks (steering, acceleration, braking, etc.).

1. DRIVER ASSISTANCE
The vehicle features a single automated system (e.g., it monitors speed through cruise control).

2. PARTIAL AUTOMATION
ADAS. The vehicle can perform steering and acceleration. The human still monitors all tasks and can take control at any time.

3. CONDITIONAL AUTOMATION
Environmental detection capabilities. The vehicle can perform most driving tasks, but human override is still required. Human override is still an option.

4. HIGH AUTOMATION
The vehicle performs all driving operations at conditions. Zero human attention or interaction is required.

5. FULL AUTOMATION

7 TYPES OF ARTIFICIAL INTELLIGENCE

2. Artificial General Intelligence: AI designed to learn, think and perform at similar levels to humans.

3. Artificial Superintelligence: AI capable of surpassing the knowledge and capabilities of humans.

4. Reactive Machines: AI capable of responding to external stimuli in real time; unable to build memory or store information for future.

5. Limited Memory: AI that can store knowledge and use it to learn and train for future tasks.

6. Theory of Mind: AI that can sense and respond to human emotions, plus perform the tasks of limited memory machines.

7. Self-aware: AI that can recognize others’ emotions, plus has sense of self and human-level intelligence; the final stage of AI.
Generative-AI

Do not be disappointed; the model is rather trivial; only the context makes it more relevant; see quantity vs quality!

The working model is like having all the maps and trying to get from A to B, in a mountain region (you have detailed maps of), by checking the stability of any little rock and decide to go one step ahead (after seeing that you didn’t fall); and so, repetitively, until the end is reached. Same as marching on moving sand! The process is deemed having additive errors.

The key process: guessing, predicting, and getting a weight of successful action; then, repeat, until you reach the peak!

The approach is based on Large Language Models; a large amount of data is stored; patterns are inferred from it, in the context (derived from a query through a known token). No token means no answer or a tentative (usually wrong) one.

Note: The text is broken down into chunks, which can be as short as one character or as long as one word (or even more in some languages). Jumping from a chunk to another is a question of in context-prediction (there are other cosmetics such normalization, greedy decoding, beam, searching, etc.)

Much better than Google translator! Comprehension of narratives with mixed-languages!

Some obvious limitations of generative-AI (as of Nov. 13, ‘23)

- There are not real bidirectional interactions; the only way for a better accuracy is obtained by rephrasing the query
- Knowledge is limited to public data access only (no private, no scientific databases); therefore, no validated
- Knowledge is behind the real state-of-the-art (however, lagging by a few years, in any domain, means a lot on accuracy)
- There is no guarantee, no liability; this situation leads to limited trust, or no trust at all.
- Some feedback is cooked, incomplete or incorrect; some is wrong but expressed with confidence (test-try-trust-test-.... )

YET, Generative-AI is useful in many cases, especially as a quick idea (mostly useful for already knowledgeable people)
Generative-AI (example)

- Petre: What might follow after 'I am ..."?
- ChatGPT: The phrase "I am ..." can be followed by a wide variety of words or phrases to describe or define oneself or one's current state. Here are some examples:

  Descriptions of identity or profession:
  - I am a teacher.
  - I am an engineer.
  - I am a mother.
  - I am a student.

  Emotional or physical states:
  - I am tired.
  - I am happy.
  - I am confused.
  - I am sick.

  Personal beliefs or opinions:
  - I am certain that...
  - I am of the opinion that...
  - I am convinced that...

  Locations:
  - I am at home.
  - I am in the office.
  - I am on my way.

  Descriptions of characteristics or personality:
  - I am outgoing.
  - I am introverted.
  - I am ambitious.
  - I am kind-hearted.

  Temporary situations or roles:
  - I am the team leader for this project.
  - I am the designated driver tonight.
  - I am on a diet.

  Affiliations:
  - I am a member of the local club.
  - I am a Democrat/Republican.
  - I am a Christian/Muslim/Hindu/etc.

Back in ’80, 90’

Expert systems
Rules-based systems
A* algorithm
AI (Japanese, Fifth Generation)
Lisp
Prolog
**Generative-AI (example)**

- Petre: What physical state can a human be in?
- ChatGPT: Humans can exist in various physical states, based on physiology, consciousness, and activity. Here are some general categories of physical states:

**Conscious States:**
- Wakefulness: The state of being alert and aware of one's surroundings.
- Drowsiness: A transitional state between wakefulness and sleep, often characterized by a decrease in alertness.

**Sleep States:**
- Non-Rapid Eye Movement (NREM) Sleep: Divided into three stages (N1, N2, N3), ranging from light to deep sleep.
- Rapid Eye Movement (REM) Sleep: The sleep stage associated with vivid dreams.

**Altered States of Consciousness:**
- Hypnosis: A trance-like state of focused attention and heightened suggestibility.
- Meditation: A state of deep concentration or relaxation, sometimes accompanied by a shift in awareness.
- Flow: A state of being completely absorbed or immersed in an activity, often accompanied by a loss of the sense of time.
- Trance: A semi-conscious state, often brought on by repetitive sounds, movements, or rituals.

**Physiological States:**
- Resting: Characterized by a reduction in physical and mental activity, but not necessarily asleep.
- Activity: Engaged in physical or mental tasks, ranging from mild (e.g., walking) to intense (e.g., sprinting).
- Fasting: The state of not consuming food for a period.
- Digestive: Post-meal, where the body is processing and absorbing nutrients.

**Emergency Responses:**
- Fight or Flight: An acute stress response, preparing the body to either face a threat or flee.
- Freeze: An immediate reaction to danger or threat, characterized by immobility.
- Fawn: Behaving in a servile manner or trying to please a potential threat to diffuse danger.

**Health-Related States:**
- Healthy: Optimal functioning and well-being.
- Illness or Disease: Compromised health due to infections, chronic conditions, or other diseases.
- Injury: Physical damage or trauma.
- Recovery: The process of returning to a healthy state after illness, injury, or surgery.

**Life Stages:**
- Fetal: Pre-birth, developing inside the womb.
- Infancy: Early stage post-birth.
- Childhood, Adolescence, Adulthood, Senior: Various stages of life characterized by physical, cognitive, and social changes.
Let us set the record straight \textit{(as of Nov 13rd, 2023)!}

Inventions (~1% on purpose, 99% unintended discovery); on former, I know a very few, indeed!

Basis is: 'understanding' and 'inserting' a new acquired information in the right place of the existing knowledge. Mostly, incidental action, followed by experience, failures, experiments again, improvements, acceptance, improvements, etc.

Let us think at:
- Fire
- Matches
- Tires (cars, bicycles, ...)
- C Vitamin
- Stickers
- Wheels
- Bicycles

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Music (i) (mind expression, even silent)
Music instruments (ii) (100% invention) for sharing

CEO warns of ‘very strange outcomes’ from new tech with ‘superhuman’ skills

Oracle of Delphi

Delphi was an ancient religious sanctuary dedicated to the Greek god Apollo. Developed in the 8th century B.C., the sanctuary was home to the Oracle of Delphi and the priestess Pythia, who was famed throughout the ancient world for divining the future and was consulted before all major undertakings.

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True AI Enthusiasts and Supporters
Professors trying to get various flavors of scientific help in their teaching endeavor: CENTRIC, ICSEA, CYBER, etc.)

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Cutting through the Hype
(towards AI - so-called Literacy!)

Fathering AI
AI Experts
AI Analysis
AI Ethicists
AI-based producers
AI Beneficiary

AI culture, AI Literacy
AI skeptics
AI charlatans

AI Governments summit
AI (-self) governance
AI governance
Corporate self-guaranty entitlement
Corporate self-explainability duty
(see: Oracle of Delphi)
Corporate self-safety checking

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IVAIA
Let us not foul ourselves!

Valencia
November 2023
It seems that Media take us for fools and bombard us with alarming news about the destruction of humanity!

When a (right or wrong) statement is endorsed by one known name, there is little chance to object! Yet... !?

Note:
- A crane sure surpasses the capabilities of humans, when it comes to lift heavy pieces.
- An automatic searching engine will certainly exceed the human skills for (quicker) grabbing information from websites.
- Dangers come from humans handling AI-tools, not for the AI-tools; see the dynamite!

What does the Microsoft co-founder now say about artificial intelligence? You may be surprised.

The Gist
• Deepfake danger. Al can help identify deep fakes and safeguard democracy, and there are lessons for customer experience and marketing professionals.
• AI security. Prioritize software vulnerability fixes and establish AI regulation.
• Job shift. Manage Al’s job impact with support, retraining and strategic policies.

https://www.youtube.com/watch?v=s1qZbsytk08
It seems to me being an eerie prediction, indeed, but not the sense of the article.

https://www.foxbusiness.com/technology/elon-musk-ai-eventually-create-situation-no-job-needed

The Gist:
"We will have for the first time something that is smarter than the smartest human," Musk added.

Musk said, "It's hard to say exactly what that moment is, but there will come a point where no job is needed."

"You can have a job if you want to have a job — sort of personal satisfaction — but the AI will be able to do everything," the billionaire Tesla CEO added.

But the lack of guardrails surrounding AI has not stopped Musk from developing his own generative AI models to compete with those already available for commercial use, including chatbots ChatGPT and Google's Bard.

A "maximum truth-seeking" AI chatbot could be coming, which he dubbed "TruthGPT."
IF you think that this is Al, then, I am kindly inviting you to revisit the meaning of: ai vs Ai vs aI vs AI

(MUST) next steps, for the very first next Al (true) Level:
Mechanisms leading to inventions, things, and facts that are not apriori known: sailing, rowing, flying,... video cameras, cooking recipes, clothes buttons, sewing needles, perfusion needles, bicycle pedals, etc.; they came as a necessity; an artificial piece has no necessities to be fulfilled.

PRIORITY #1
Discovery and understanding of Brain mechanisms; thinking, inventing, acting, self-repairing, body coordination, external exposure, feeling necessities, etc., etc.
This will allow us to go to the next level of Al fulfillment, if ever.
Some timid (yet, in progress for ~ 50 years) steps: Machine-Brain interface, Cognitive Research
The greatest difficulty is that one cannot do conclusive experiments on humans’ brain. No experiments, no progress!

Note: Knowledge for understanding mental diseases, Parkinson procedures, addiction, etc. is badly missing.
This might be at Level 5 on the Al-scale in terms of achievements (understanding what does not work in the Brain and invent cures for findings, namely, Al-self-healing via AI itself). YES, this might be the pilar piece of AI dream.
**Petre: What are the most prominent Cognitive achievements as of Sept '21**

ChatGPT: As of September 2021, cognitive science, which encompasses interdisciplinary research from psychology, neuroscience, philosophy, artificial intelligence, and several other disciplines, has seen numerous achievements over the years. Some of the most prominent (?: I do not know who decided this complement) cognitive achievements include:

- **Neuroplasticity**: The discovery that the brain is plastic, meaning it can change and adapt structurally and functionally throughout life based on experiences. This challenged the once-held belief that the brain's structure is fixed past a certain age.

- **Mirror Neurons**: The identification of neurons that fire both when an individual acts and when they observe the same action performed by another, leading to insights into empathy, imitation, and social cognition.

- **Dual-Process Theory**: The proposal that there are two systems of thought: "System 1" which is fast, instinctual, and emotional; and "System 2" which is slower, more deliberative, and more logical.

- **Cognitive Behavioral Therapy (CBT)**: Development and widespread acceptance of this form of psychotherapy, based on changing negative thought patterns to produce more positive behaviors and outcomes.

- **Mapping the Brain with fMRI**: Functional Magnetic Resonance Imaging (fMRI) has allowed researchers to non-invasively study brain activity, illuminating how different brain regions function and interact.

- **Understanding Memory**: Insights into different types of memory, like procedural, declarative, short-term, and long-term memory, and how they're stored and recalled.

- **Cognitive Load Theory**: The understanding of how cognitive resources are allocated during learning and the strategies to optimize this process.

- **Artificial Neural Networks**: Drawing inspiration from the brain, these computational models have led to significant advancements in machine learning and AI, particularly in tasks like image and speech recognition.

- **Embodied Cognition**: The idea that the mind is not only connected to the body but that the body influences the mind, emphasizing the role of sensorimotor experiences in shaping cognition.

- **Advancements in Understanding Disorders**: Improved comprehension of cognitive disorders such as Alzheimer's, ADHD, and Autism Spectrum Disorder, leading to better therapeutic approaches.

- **Cognitive Offloading**: The exploration of how and why humans use objects and tools in their environment to reduce their cognitive workload.

- **The Role of Sleep in Cognition**: Discoveries related to the importance of sleep in memory consolidation, emotional regulation, and problem-solving.

These achievements only scratch the surface of the continuous advancements in the field. The interdisciplinary nature of cognitive science ensures that it remains at the forefront of understanding the intricacies of the human mind and its intersection with technology and society.
Artificial Intelligence (AI) originally intended to create machines that could mimic human intelligence: to reason, learn from experience, recognize patterns, comprehend complex ideas, and employ language in meaningful ways, namely, to develop systems that could perform tasks that, when done by humans, would require the application of intelligence (emulation of cognitive functions, associated with human minds.

Over time, AI became an umbrella including a broad range of computational techniques and methods. Towards its original target practical applications helped creating specialized, task-specific algorithms and models. Yet, the underlying ambition remains: to capture or replicate facets of human intelligence in a machine, bridging the gap between organic cognition and digital computation.

The fields of AI, machine learning, statistics, and pattern recognition have interwoven histories, and many techniques have been appropriated or evolved across these disciplines over time.

More AI specific
- Datasets (variety, solid methodology, etc.)
- (layered) Deep Learning (CNN, recurrent, transformer architectures, etc.)
- ? ML (accuracy, parameter tuning, computational needs, etc.)
1. Neural Networks and Their Variants:
   - **Feedforward Neural Networks**: Basic networks where connections don’t cycle back.
   - **Convolutional Neural Networks (CNNs)**: Tailored for image data.
   - **Recurrent Neural Networks (RNNs)**: For sequential data.
   - **Long Short-Term Memory (LSTM) and Gated Recurrent Units (GRU)**: Advanced RNNs.
   - **Transformer Architectures**: Like BERT, GPT, which have revolutionized NLP.
   - **Generative Adversarial Networks (GANs)**: For generating data.
   - **Autoencoders**: For dimensionality reduction and data generation.
   - **Self-organizing maps, Hopfield networks, and Boltzmann machines**: Early forms of neural networks.

2. Reinforcement Learning:
   - Algorithms like Q-learning, Deep Q Networks (DQN), and various policy gradient methods like REINFORCE, A3C, and PPO predominantly belong to the AI realm.
   - Monte Carlo Tree Search (MCTS): Used in game-playing AI like AlphaGo.

3. Modern Optimizers: Techniques like Adam, RMSprop, and AdaGrad, developed mainly in the deep learning context.

4. Attention Mechanisms: Especially in the context of neural networks, allowing models to "focus" on specific parts of the input.

5. Transfer Learning: Techniques like fine-tuning where pre-trained models are adapted to new tasks.

6. Few-shot and Zero-shot Learning: Techniques that enable models to make predictions in scenarios where very few or no examples are available.


8. Explainable AI (XAI): Techniques specifically designed to make AI decisions interpretable.

9. Neural Turing Machines and Differentiable Neural Computers: Extensions of neural networks to give them the ability to work with external memory in a differentiable manner.

10. OpenAI’s DALL-E, CLIP, etc.: Represent a new wave of models trained to perform tasks like image generation from textual descriptions.
For everybody's comfort

Humanity will not be replaced by artificial entities as
- There are no personalized memory(ies)
- There is no instant personalized thinking
- There is no visibility on any personal past activity
- There are no feelings of fear, emotions (eventually mimicking by instructions/learning)

Do not fear and do not have compassion on those thousands that regret fathering AI, because there were very few of them; most of the tens of thousands vocal ones truly were and are not.

These two pictures: 2023 – March, Wilmington DE, MedExpress Lab Poster and Vitaly’s input from the College of Healthcare Information Management Executives, April 1995, (Canada) triggered my initiative for documentation and for preparing this open discussion.

Lessons learned
- Technologies were developed in a silos with great success
- Last 30 years of achievements allowed comprehensive results
- Awareness
- Education
- Societal services
Summer of 1956 at Dartmouth College in Hanover, New Hampshire, USA

These men had a shared vision for the potential of AI. They believed that it was possible to create machines that could think and reason like humans, and they propose a workshop to explore this possibility.

Meet the brilliant minds of John McCarthy, Marvin Minsky, Herbert Simon, Oliver Selfridge, Nathaniel Rochester, Ray Solomonoff, Trenchard More, and Claude Shannon who kickstarted the AI revolution.


The Proposal

“We propose that a two-month, ten-man study of artificial intelligence be carried out during the summer of 1956 at Dartmouth College in Hanover, New Hampshire”

The written proposal to the Rockefeller Foundation was formulated by McCarthy at Dartmouth and Minsky, then at Harvard. They brought their proposal to the two senior faculty, Claude Shannon at Bell Labs and Nathaniel Rochester at IBM and got their support (Crevier, 1993). The proposal went as follows (McCarthy et al, 1955, reprinted in AI Magazine Volume 27, Number 4 pp. 12–14):
From: Special Issues of Artificial Intelligence

Artificial Intelligence and Learning Environments

Edited by William J. Clancey and Elliot Soloway

168 pp., 6 x 9 in,
Paperback
ISBN: 9780262530903
Published: September 27, 1990
Publisher: The MIT Press

Missing (I don’t know the reason)
Elliot Soloway: University of Michigan
- AI (Intelligent) Tutoring Systems
- Learning/cognition at children level
Noam Chomsky: MIT
- Modern linguistics
- Analytic philosophy
and
- One of the founders of the field of cognitive science

Opinion | Noam Chomsky: The False Promise of ChatGPT
Mar 8, 2023 — As an AI, I am a machine learning model that has been trained on large amounts of text data, and I don't have personal experiences or feelings.

Noam Chomsky - Advances in AI: ChatGPT | Human Brain
Considered as the father of modern linguistics, Noam Chomsky talks about recent advances in natural language processing, artificial...
A little history... well-back
Multivariate Dataset introduced by Ronald Fisher (1936).
The first artificial neuron was the Threshold Logic Unit (TLU), or Linear Threshold Unit, first proposed by Warren McCulloch and Walter Pitts in 1943.
Neural networks were first proposed in 1944 by Warren McCullough and Walter Pitts - University of Chicago (then, MIT).
The concept of Deep learning has been around since the 1950s.
The earliest successful AI program was written in 1951 by Christopher Strachey, University of Oxford.
Strachey's checkers (draughts) program ran on the Ferranti Mark I computer at the University of Manchester, England.
The Dartmouth Summer Research Project on Artificial Intelligence, 1956 summer workshop - considered to be the founding event of AI.
Generative AI was introduced in the 1960s in Chatbots.
Convolutional neural networks, also called ConvNets, were first introduced in the 1980s by Yann LeCun.
AI ups&downs (~ ‘90-’2Ks. Expert Systems failing highly-set expectations) {smart systems, cognitive systems, autonomous systems, etc,...}

Generative AI (GAI) (processing: text, pictures, audio, ...) | | from 60's Chatbots → 2022 LLMs (Solid state to VLSI : 1940 → 1960/70)
> Summarization, surveys, statistics, general reports; no measurements, no innovation, no link to reality, no interpretation, no feedback
> GAI tools generate new content based on a variety of inputs. Inputs and outputs to these models can include text, images, sounds, animation, 3D models, or other types of data.
> There is no validation of data, there is no corrective feedback, there is no guarantee, .... (user awareness)
Traditional AI targets (patterns, decisions, real systems, cognitive processing, brain-like mimicking, .. brain substitution, cohabitation, etc.)
AII
AGI
ASI
Knowledge and Information of any kind

----> ~ 99% undetected/not check-able false information (on purpose coalitions, or simple fake, or science fiction)
and
----> ~1% fact-checked information
---- >>> any inference leads to biased, unproved, and unanimously (falsely) trusted facts/conclusions

Danger of too much pre-processing: of Data compression/fusion/pre-processing
Inquiry: How much data processing is enough (see 99.999% service availability)

ROI on Costs: Data Quality Assurance (profiling, cleansing, validation, auditing, etc.)

Lack of Academic Curricula and advanced Education on AI-fluency

Note: 99%, 1% is my pessimistic estimation.
You can cite me, as there is no proof either way!

99,999% was AT&T customer SLA agreement on service availability, by the year 2000
However, a tiny fraction (~ 7%) of Syslog messages were possible to be processed in the NOCs (Network Operation Centers)
A. IEEE Webinar (regular emails to members)

Theme: Selecting your next oscilloscope; Why digital triggering matters?
White Paper by ROHDE&SCHWARTZ


ChatGTP Q: I ask the same question, I refined for brands of portable oscilloscopes, then refine for 'hysteresis' control, other functions, etc.

B. IEEE Spectrum (Sept ‘23)

Preparing IEEE for 2050 and Beyond (by Kathy Pretz)
“... how the information is curated and delivered will change
> .. Initial vetting will be partially/fully automated
> Proceedings will be a compendium of articles, algorithms, videos, and other media (kind of Encyclopedia Britannica)
> Promoting the use of AI, Virtual Reality, Digital Twins.... practically, virtual models of our real-world

C. Interactive hesitation of LLM-based (fledgling) tools; (ChatGPT)

D. Barron’s (Oct ‘23) AI Analysis on AI Market value as of Oct 30.

Some obvious proofs on use of tools

History (random selection)
- gun powder
- dynamite
- knives
- nuclear arms
- ...

- AI-induced scarecrow

Potential causes (random listing)
- On purpose induced fear
- Stupidity
- Ignorance
- Credulity, Naivety
- Mislead by others (on purpose, or not)
- Lack of proper education, self-evaluation
- .... add (whatever you want)
Case study #1 | Puzzled, yet Informed

Selection tools/devices (Oscilloscope, Spectrum Analyser)

Petre (background: electronics, measurements, signal processing, long term practice, ...)

Students receiving info from ChatGPT on “What are the criteria for selecting my next oscilloscope, considering Digital achievements?”

Output: Background is assumed
Practicing is assumed
Learning from experience is assumed

Curriculum proposal: Hybrid teaching

Basics: provided by professors (selectively, tuned to students’ background, feedback loop, etc.)
Practicing: in a real lab (currently, a lot of videos, showing practices, but not self-practicing)
Validation of knowledge (boosting self-confidence)
Reading materials (ChatGPT)
Finding unclear topics (ChatGPT)

Case study #2 | Puzzled, yet Informed

Scientific contributions

Petre (background: teaching, writing, learning, self-criticizing, asking for peers, reviewing, failures, accept/reject, ...)

Students receiving info from ChatGPT on ‘exact research topics’, no failures, no arguments-against, no base for understanding a particular statement

Output: Students remain ignorant (not knowing ‘why’) [theme itself, state-of-the-art, critical thinking on open issues, etc.]

Students lose ability to write by themselves; self-confidence, gradual improvements, self-critical (fights between the models)

Students do not acquire the ability to identify mistakes and to confidently evaluate others’ work

Education: Next professors might be less gifted with adapting to different levels of student understanding (see: Intelligent Tutoring Systems)

Tooling effort to put on catching culprits instead of massive education and enforced punitive rules.

Approach proposal: Hybrid scientific education/evaluation/creation + explicit and mandatory ethics rules

Automated tools should complement, not replace, the researcher’s own judgment and understanding of their work. Especially in academic contexts, nuanced and context-specific decisions about language and phrasing are crucial. It’s always a good idea to have a human with expertise in the subject area review the paper in addition to using AI-based tools.

A collaboration between AI tools and human reviewers and new scientific thinkers seems to be the most promising way forward, capitalizing on the strengths of both, namely, volume and speed of AI-based tools + intelligence and cognition via human thinking.

Anti-plagiarism tools are essential for educators, students, and writers to ensure the originality of content. Yet, they should be not needed, if education on fairness is enforced and punishment for wrong doers is enforced, too.

PORTO: https://www.aria.org/conferences2023/filesSECURWARE23/PetreDini_OpenDiscussion_WhereAI.pdf
Case study #3 | Informative, partially useful, unintended errors

Gradually difficult Interaction
On Being Informed and Being Trained by Generative-AI: Lessons Learned Illustrated from Practical Cases

A. What period Napoleon reigned and how many wars he was involved in?
   i. You might not have any idea; yet historical information seems accurate
   ii. You can cross-validate with multiple documents, if vital.

B. What are the specific wine grape species and wine brands of the Oltenia region, part of Romania?
   i. You have an idea; the question was tuned a few times until the correct answer was crafted.
   ii. It depends on how much the notion in questions is spread and on 'how many entries are available' on the topics for sufficient training.
      (correctness depends on volume of training data, at a given point in time)

C. How to select a spectrum analyzer device?
   i. The output of G-AI assumes a solid training and implicit knowledge of a subject.
   ii. The answer leaves the impression of easiness, while the background of the user is missing.
   iii. The practical experience is assumed in specific answers.
   iv. Classical classes, labs, and projects are needed

Caveat:
When the problem is described in detail, a spectrum analyzer device might be picked, on somebody’s behalf, with no influence on the selection/decision.

? Explainability, Over-confidence, AI-self-empowerment
### Best-performing AI stocks

Here are the seven best-performing stocks in the Index Global Robotics & Artificial Intelligence Thematic Index, ordered by one-year returns. This list is updated weekly.

<table>
<thead>
<tr>
<th>Ticker</th>
<th>Company</th>
<th>Performance (Year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NVDA</td>
<td>NVIDIA Corp</td>
<td>241.65%</td>
</tr>
<tr>
<td>SYM</td>
<td>Symbotic Inc</td>
<td>214.85%</td>
</tr>
<tr>
<td>HLX</td>
<td>Helix Energy Solutions Group Inc</td>
<td>113.75%</td>
</tr>
<tr>
<td>A1</td>
<td>C3.ai Inc</td>
<td>107.39%</td>
</tr>
<tr>
<td>AVAV</td>
<td>AeroVironment Inc</td>
<td>46.51%</td>
</tr>
<tr>
<td>DT</td>
<td>Dynatrace Inc</td>
<td>38.10%</td>
</tr>
<tr>
<td>PATH</td>
<td>UiPath Inc</td>
<td>35.07%</td>
</tr>
</tbody>
</table>

Source: Finviz. Data is current as of Oct. 25, 2023 and is intended for informational purposes only.

### Largest AI companies by market capitalization

<table>
<thead>
<tr>
<th>#</th>
<th>Name</th>
<th>M. Cap</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Microsoft 1MSFT</td>
<td>$2.451 T</td>
</tr>
<tr>
<td>2</td>
<td>Alphabet (Google) 2GOOG</td>
<td>$1.536 T</td>
</tr>
<tr>
<td>3</td>
<td>NVIDIA 3NVDA</td>
<td>$1.000 T</td>
</tr>
<tr>
<td>4</td>
<td>Tesla 4TSLA</td>
<td>$658.99 B</td>
</tr>
</tbody>
</table>

35 more rows

MARKET - Generative-AI

NVIDIA CORP (NVDA)

432.99 - 0.45 (-0.10%)

YEAR TO DATE (+96.28%)

BARRON'S INSIGHT

ALEX EULE | BARRON'S DEPUTY EDITOR

NVIDIA IS THE ONLY COMPANY NOW SEEING REAL EARNINGS BENEFIT FROM A.I.

BARRON'S INSIGHT

THE BUSINESS OF A.I. IS COMPLEX AND IT WILL TAKE YEARS FOR WINNERS TO EMERGE
• Theme questions:
  • Is education/research getting out of human essence?
  • Who is going to infuse the human skills to students and young researchers from now on?
  • Are we baffled, and finally, unable to deny the wrong we perceive because of the trend and hype (political correctness)?

• #1 Will (free or commercial) Generative AI-based tools for handling editorial, punctuation and English be the basis for research?

• #2 Is human-based peer-reviewing process going to be replaced by Generative-AI-based peer-reviews, and teacher guidance by a set of narratives via generative-AI?

• #3 Are we hypocrite with double-blind review vs one-side blind review process when accepting unexplainable guidelines based on Generative-AI? (see: AI explainability)

• #4 Is Generative-AI-based feedback going to replace our education system (classes, research, projects)?

• #5 Are classes, professors already ‘obsolete’ and only still being maintained in the picture by ‘empathy’?

• #6 What is the correct market value vs. the societal benefits?

• #7 How education systems should be adapted?
AI, Generative-AI, LLM, ML, Deep Learning, Graphs, Ontologies, Taxonomies, etc. are only the pick of iceberg of human thinking process, perception & storage of data and building knowledge upon

A. Knowledge acquiring and Learning are different from generation to generation.

B. Learning, as we teach, is only mimicking with an unknown approximation degree of how the human brain is working.
   see: typoglycemia [analogy with an editor corrector] due to human intuition

C. Digital deskilling is the biggest danger of AI-based approaches/tools

D. Danger: The learning curve is much slower than the technology evolution pace.
   Procrastination is not a solution for being updated on changes.

Typoglycemia is the ability to read words even when the letters are jumbled, as long as the first and last letters remain in their correct positions. The human brain has the capacity to quickly process and comprehend written language, even with scrambled letters; even more, mixing letters and figures, e.g., v1tural -> virtual, 3rcaotr -> tractor.
Typoglycemia, playing with typo and glycemia (the condition of having low blood sugar).
STAGE IS YOURS
Share your thoughts, experience, position

Caveat
We could be right, or fully wrong!
Back-up materials

Oscilloscope /əˈsiləˌskɒp/ vs. Spectrum Analyzer /ˈspektrəm ˈænlˌɪzar/

(Tektronix)

https://www.youtube.com/watch?v=NBJCv0ONPnw

Note:
It seems easier while ‘only reading’
The very first achievement is to find the right button
Webinars – Oscilloscope-a

VALENCE
November 2023

https://www.youtube.com/watch?v=NBJCv0ONPnw

• Spectrum Analyzers vs Oscilloscopes Webinar with Tektronix
Webinars – Oscilloscope-b

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https://www.youtube.com/watch?v=NBJCv0ONPnw
Webinars – Oscilloscope-c

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• https://www.youtube.com/watch?v=NBJCvOONPnw