Use of Artificial Intelligence & Machine Learning in current status of Medical Forensic leading to efficient Justice Delivery Mechanism

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- **Definition**
- **Introduction**
- **History**
- **Fields of Application**
- **Key Elements**
- **Utility**
- **Types**
- **Advantages/Disadvantages**
- **Challenges and Limitations**
- **Basic Concepts**
- **Future Directions**
- **Conclusion**

Definition of Artificial Intelligence/Robotics

- Stimulation of human intelligence processes by machines, especially computer systems

- It is a set of technologies that enable computers to perform a variety of advanced functions, including the ability to see, understand translate spoken and written language, analyze data, make recommendations, and more.

- Studies the pattern of he human brain and by analyzing the cognitive process => develops intelligent software and systems

History

- In 1951 – successful AI program written by Christopher Strachey in 1956 – AI gained its name in Dartmouth conference organized by Marvin Minsky, John McCarthy , Claude Shannon, Nathan Rochester
- John McCarthy – Father of AI
- Founding fathers – Alan Tuning, Allen Newell, John McCarthy, Marvin Minsky
- Shakey – the first general purpose mobile robot built- acc. To a list of instructions
- US – No. 1 country in AI
- Best AI Professor in India – Dr Pushpak Bhattacharyya – Chief of Computer Science & Engineering at IIT Bombay
- First AI employee – CHARLIE- she excels in ideation and transforming activities
- AI – a female western Chimpanzee , born in 1976- acronym KUPRI
- Lexa – Conversational AI – interacting simply by conversation, voice enabled devices

- AI uses complex algorithms and methods to build machines that can make decisions on their own.
- AI Algorithm :- a set of instructions to be followed in calculations or other operations
- Machine learning and Deep learning forms the core of AI
- AI is a joint initiative by The Ministry of Electronics and IT (MeitY), National e-Governance Division (NeGD).
- AI is important in India – to improve efficiency by using the intelligence of technology & machines to perform tasks

- First female Robot in India – Robot Shalu (Creator Dinesh Patel on 25th of March, 2021)- awarded by Jagranjosh.com for bet innovation in Science & Technology by Education Minister of India Dr Ramesh Pokhriyal Nishank

- Famous AI – Geoffrey Hinton with his work on Machine Learning, Neural networks, AI, cognitive science, object recognition

- First death from AI – Robert Nicholas Williams, 23rd of January, 1979- factory worker - killed by a robot

- Professor H N Mahabala , 1960s – first AI programme in India at IIT, Kanpur

- India ranks 32nd among 181 nations in AI Readiness Index, 2022

- Female AI leader – Fei-Fei-Li, computer science professor at Stanford, advocated diversity in STEM and AI

- First AI robot in India – Manav – by Diwakar Vaish- Head of Robotics & Research

- India's first AI model – ChatGPT – named Lexi- launched by financial technology company Velocity – analytical tool

- Mother of AI – Margaret Masterman – computer speech pathologist- founder of Cambridge Language Research Unit- Pioneer in computational linguistics

- Principles of AI- Accountability, inclusiveness, reliability, safety, fairness, transparency, privacy and security.

- Develop safe , ethical, responsible, trusted, and acceptable

- Language used in AI- Python and Java. In data analysis – Python

- Human brain has 100 billion cells linked by synapses

- Human brain cells learn faster than AI- 90% glial cells of which 40% gray matter & 60 % white matter

- Weakest type of AI – Image & Facial recognition

- AI used on Cattles

- Three-toed sloth called AI in Latin America, because of high pitched cry it produces when agitated.

Large Data Set -2001
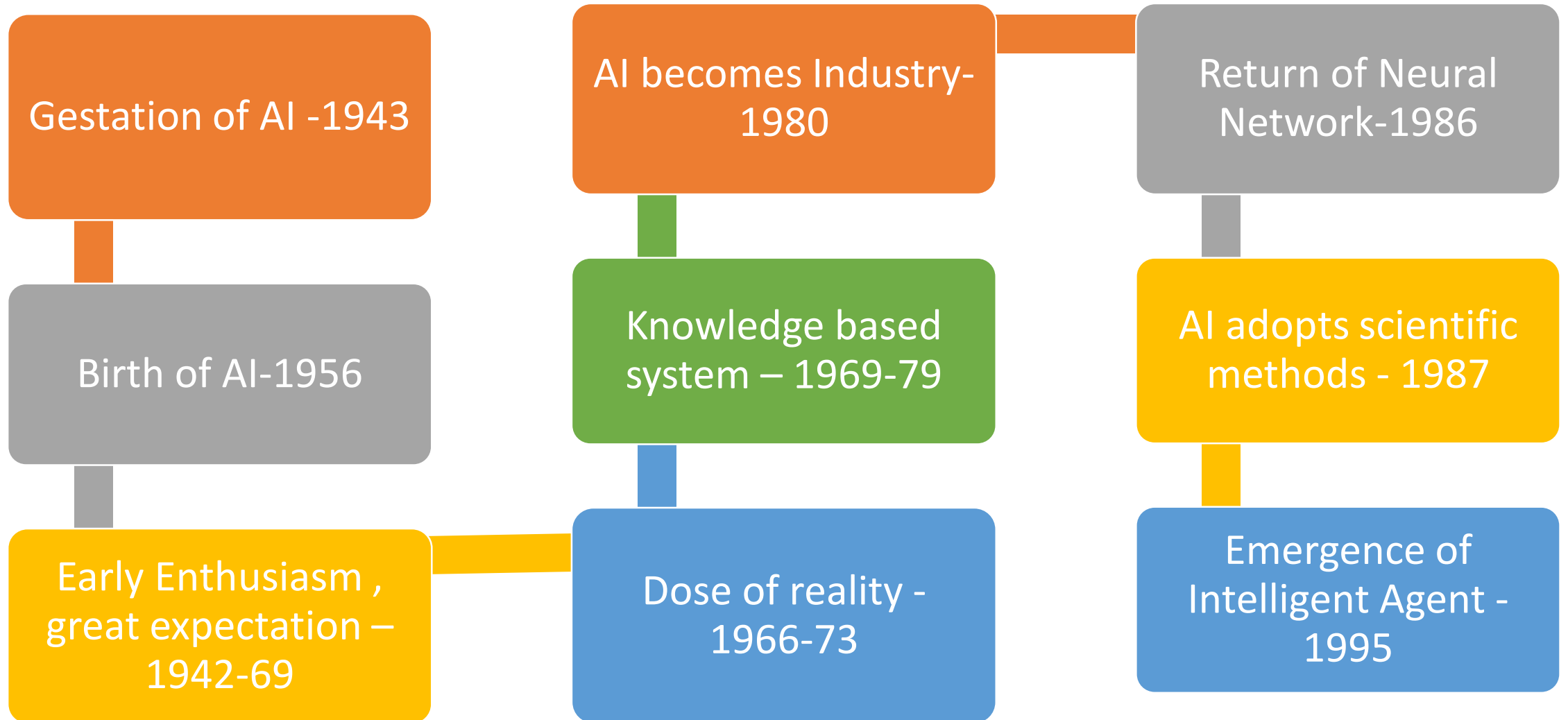
- **Fields of application of AI:-**
- ➢ Text AI
- ➢ Visual AI
- ➢ Interactive AI
- ➢ Analytic AI
- ➢ Functional AI

- **3 key element for AI:-**
- ➢ Deep Learning
- ➢ Quantum Computing
- ➢ Big Data

Utility

- Uses in everyday life :-
- ➢Offline shopping & advertising,
- ➢Web search,
- ➢Digital personal assistants,
- ➢Machine translation,
- ➢smart homes & cities
- ➢Infrastructure,
- ➢cars

- Online shopping
- Fraud prevention
- Autonomous Vehicles
- Facial recognition
- Hiring
- Gaming
- Social Media
- Travel

Types of AI

- Narrow AI or ANI
- Artificial general intelligence or AGI
- Strong AI
- Superintelligence
- Reactive Machines
- Limited Memory
- Theory of Mind
- Self Awareness

Advantages of AI

➢ Help Doctors & researchers to analyze patient data, identify potential health risks, develop personalized treatment plan, robotic radiosurgery.

➢Can significantly decrease errors and increase accuracy and precision.

➢Space exploration

➢Can do laborious works in all fields

➢Detect frauds, Manage records

➢Lack emotional side

➢Can do repetitive & time consuming tasks

➢Function non-stopping, risk reducing

Disadvantages

- AI is harmful to society –privacy violation
- Automation- greater unemployment
- Deep fakes
- Algorithmic bias due to bad data
- Socio-economic inequality
- Market volatility
- Weapons automatization
- But it has the potential to transform all organizations

- Costs incurred in maintenance & repair
- Lack Human Touch
- Lack a creative mind
- Lack common sense
- Abilities of Human may diminish
- Robots superseding Humans
- Humans may become dependent on Machines
- Wrong hands cause Destruction
- AI is completely based on pre-loaded data

Challenges

- Computing Power
- Tolerance Power
- Intuitive Thinking
- Judging Power

- ANI – where AI reached today
- General AI (AGI) – where it will reach in future
- In future AI can boost efficiency & increase human's capacity to perform certain tasks
- Takes over repetitive works & dangerous tasks

- Importance of AI :- it enables human capabilities

    Understanding

    Reasoning

    Planning

    Communication

    Perception

- To be undertaken by software increasingly effectively, efficiently & at a low cost.

Basic Concepts of AI

- Categorization

- Classification

- Machine Learning

- Collaborative Filtering

Technologies of AI

- Natural Language Generation

- Speech Recognition

- Machine Learning Platform

- Virtual Agents

- Decision Management

- AI Optimized Hardware

- Deep Learning Platforms

- Robotic Process Automation

Stages of AI

- Data Analysis
- Collection
- Cleaning
- Exploration & Modelling
- Evaluation & Interpretation
- System production & maintenance

Goals of AI

- Logic & Problem Solving
- Knowledge engineering
- Planning
- Machine Learning
- Social Intelligence & Computing
- Creativity
- General Intelligence

Evolution of AI

- Rule-based system
- Context awareness & Retention
- Domain Specific Expertise
- Reasoning Machines
- Self awareness Systems
- Artificial Superintelligence
- Singularity & Transcendence

- Importance of AI :- Forms the basis for all computer learnoing & is the future of all complex decision making
- Roots of AI :-

> Philosophy
>
> Logic
>
> Computation
>
> Cognitive Science / Psychology
>
> Biology / Neuroscience
>
> Evolution
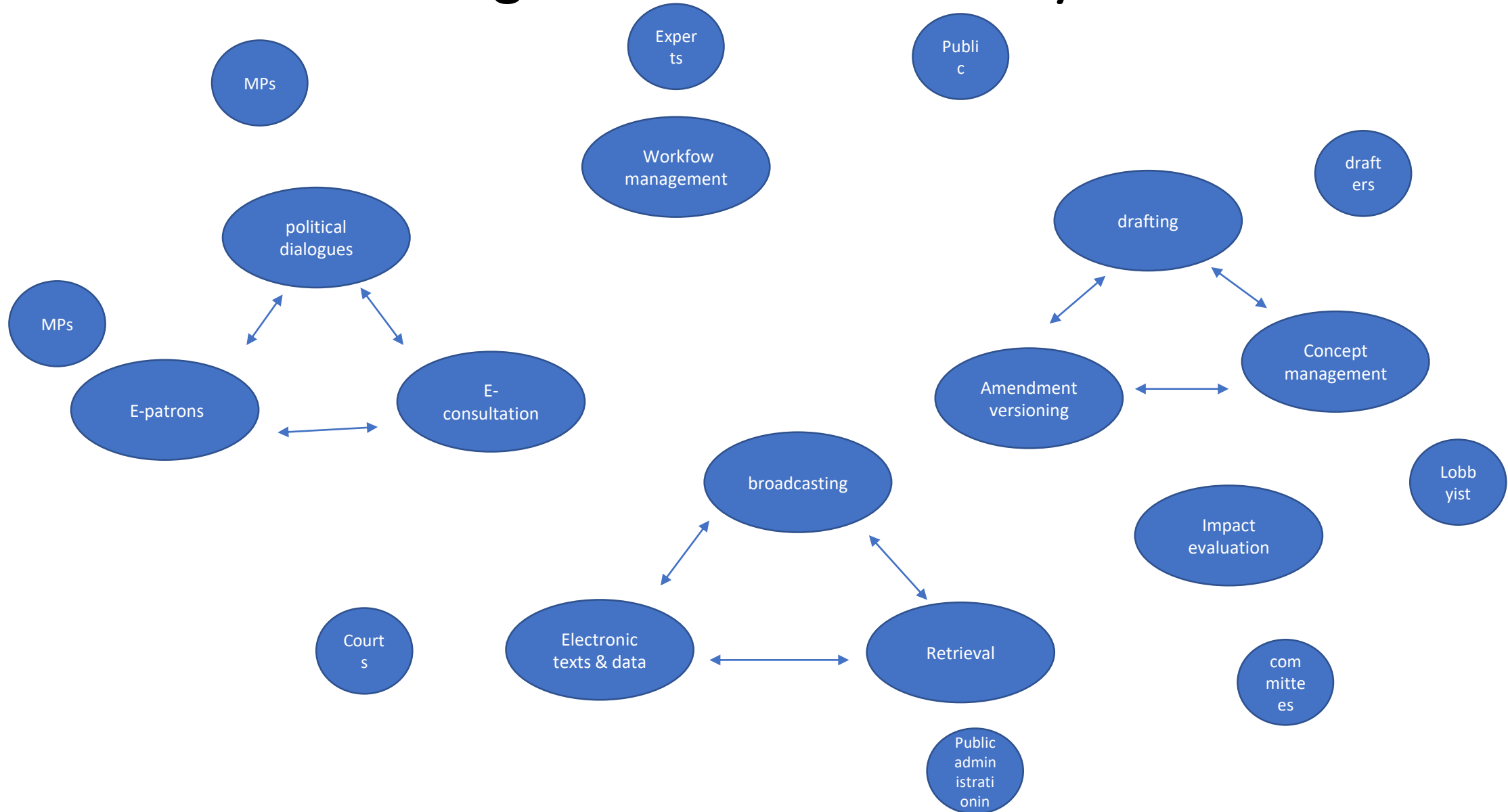
- Internet has already become :-
➤ principal source of legal cognition for citizens
➤ main source of information for lawyers
- Previously existing legal system moving into internet
- New sources of legal information emerging
- A legal Web emerging- a part of broader worldwide web

- Global Society for legislative authorities to share documents & information

- This helps all to learn from others experience , in order to frame legal provisions

- Set up legal informatics database to support legal activities:-

➤Creation of Law

➤Cognition of Law

➤Application of Law

- Legal informatics expanding from:-
- ➤Mathematics calculations
- ➤Data management
- ➤Office automation
- ➤Telecommunication
- ➤Global knowledge infrastructure

- In 1990s – creation of computerized information systems for supporting activities:-
  - Integration of so far separate applications
  - Automation as an integrated enterprise
  - Provision of new tools:
    - Occasion for reengineering processes
    - Occasion for rationalizing workflows
    - Occasion to adopt advanced techniques for managing legal information

- End of 1990s & beginning of 2000s:-

➢Legal informatics impact on management & integration of processes of law

➢Expanded its scope to the:-

❑Communication between legal organizations

❑Public- citizens, economic units , consultants (lawyers , accountants, etc

➢This is a significant aspect of e-goverment

Problems with AI

- A conscious AI cannot be constructed without knowing what exactly the conscious is

- Without this cognitive continuum , Ai has no comprehensive view of thought : it has to ignore some comprehensive thought modes – dreaming & free association

- Is uncertain how to integrate emotion & thought

- Not creative

- Scientists have to mathematically simulate human thought process

- Human brain relies on chemistry & physics of different molecules in order to function.

Software in Use based on AI

- Mobile Phones
- Video game characters
- GPS /Voice recognition
- Robotics/ Vitual Autopsy/ 3D autopsy
- Google/web
- ChatGPT and other innumerous Future Tools

Conclusions

- What is Intelligence?
- How to recreate a learning , thinking mind with technology?
- Acc. To David Gelernter , a Yale professor , Ai is ' Lost in the woods"
- But more researches needed to overcome these fallacies- like Strong AI & Superhuman(or Singularity) AI- this should be the ultimate goal in AI research
- Whole brain mapping & recreating through Neuro-imaging required
- Rapid advancement in this technology going on – as Superhuman AI designs new computers & Machines at a rate no human can function.

THANK YOU