

From ChatGPT to Precision Medicine

How AI is improving lives one neuron at a time

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What is Good AI Capital

Good AI Capital is a venture fund focusing on *early-stage AI companies* in *Fintech, Healthcare, Enterprise Software and Robotics Automation*.

With a *mission-driven thesis of doing well by doing good*, we invest in technical founders who are keen on applying AI towards solving some of the acutest problems faced across industries.

With strong beliefs in *ESG (Environmental Sustainability, Social Responsibility, Corporate Governance)*, Good AI looks for teams who share the same values in building their successful companies

With our *ample commercialization experiences*, we partner with *leading research institutions and tech transfer organizations* to identify some of their *most transformative projects*, turning them into successful companies.

Initial Patient Call



I have been coughing for over a week now. But I was tested negative in Covid this morning. I want to check with you to see if it makes sense for me to schedule an appointment with my doctor

Hi Darwin, there are many factors that can lead to chronic coughing. Despite having negative results in Covid, the coughing can still be part of the Covid symptoms.

According to your health records, you do have high blood pressure. Therefore you are at high risk with Covid. I would still recommend you have that cough checked out.

Dr Altman has an opening this afternoon. Would you be able to come in at 2:00pm?



Follow-up Patient Call



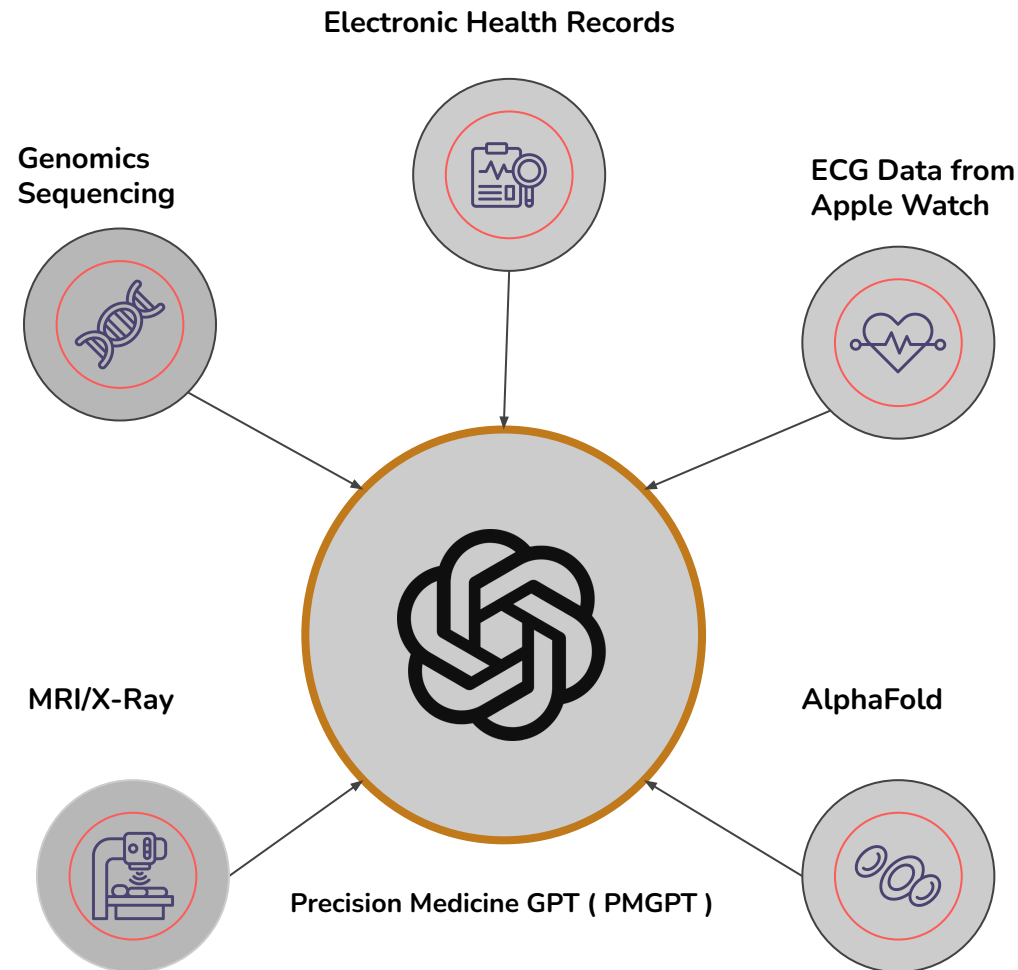
I was tested positive with Covid this morning. I want to check with you to see what do I need to do now?

Hi Darwin, I saw that Dr Altman has prescribed some antibiotics for the coughing last time. Now that you are tested positive with Covid, I think it might still make sense for you to check in with the doctor.

Dr. Altman does not have any opening today. However, I can schedule a virtual visit with our practitioner. Would 3:00pm work?



Precision Medicine GPT (PMGPT) : The Future of Medicine



Precision Medicine : tailoring of treatments and therapeutics based on patients' profile

Current modalities (Vaccines, Diagnostics, Gene/Cell Therapies, Mobile APP for Diabetes Management) typically include data input from **single source of data (Liquid Biopsy, MRI, Genomics, Electronic Health Record, Gut MicroBiome, etc)**

What if we can ingest data from these sources, and build an aggregate **foundation model** that would enable physicians to prescribe a **personalized** treatment for their patients.

Introducing **Precision Medicine GPT (PMGPT)**, the Future of Medicine

A Machine That Can Finish Your Sentence

The underlying idea of GPT-3 is a way of linking an intuitive notion of understanding to something that can be measured and understood mechanistically, and that is the task of predicting the next word in text.

Ilya Sutskever, Chief Scientist at OpenAI

GPT (Generative Pre-Trained Transformers) is a novel **neural network** that allows the chatbot to guess the next word in a sentence

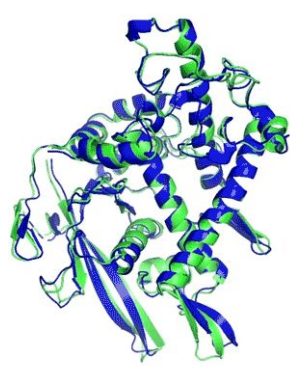
Addresses the shortcomings of existing model such as **RNN (Recurrent Neural Network)**, which is **processing language in a sequential manner**

Trained by a **massive amount of data (45TB of data, 135 Billion of parameters)** from the internet , GPT is able to learn skills such as language translation and question answering

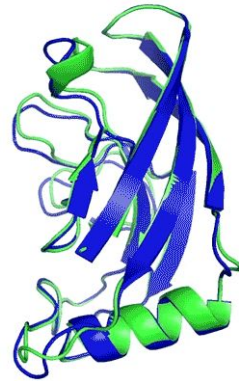
By mastering these tasks, GPT would also **learn how a natural language is pieced together**

[A Video Tutorial explaining the Transformers Architecture](#)

DeepMind's AlphaFold : A solution to a 50-year-old grand challenge in biology



T1037 / 6vr4
90.7 GDT
(RNA polymerase domain)



T1049 / 6y4f
93.3 GDT
(adhesin tip)

● Experimental result
● Computational prediction

Two examples of protein targets in the free modelling category. AlphaFold predicts highly accurate structures measured against experimental result.

Protein Folding : The physical process by which a protein chain is translated into its native 3D structure

Essential parts of life, **proteins** (chains of amino acid) functions depends on its unique 3D structure

Revealing the **predicted structures of almost all known proteins**, AlphaFold's AI Model is unlocking greater understanding of what the proteins do and how they work.

Advance treatments for many diseases (Protein Misfolding for Amyloid Alzheimer) and find enzymes that break down industrial waste.

AlphaFold, a **transformer-based neural network trained using the amino acid sequences**

Vertical AI, the next set of startup opportunities beyond ChatGPT



When asked about the next startup companies one should start, Sam Altman (OpenAI's CEO) replied "Go build a vertical AI startup"

- The power of ChatGPT is being demonstrated via publicly available data.
- What if we can build on top of ChatGPT using private data?
- Any startup who has access towards proprietary data will have the competitive advantages.
- Data access built through partnerships
- Data can also be generated. (Synthetic Data)

VastBiomes : From Bugs To Drugs



- Multi-Disciplined Team from Google, Johns Hopkins and Harvard incubated at Texas Medical Center (MD Anderson Cancer Center) is using AI to map the gut microbiome to discover biomarkers and novel cancer therapies
- Leveraging the latest in genetic sequencing and deep learning AI tools, VastBiome's VBx1 technology can now ingest and curate a large amount of patient data in order to determine the exact genetic makeup of the microbiomes
- Using synthetic biology, VastBiome would produce the molecules based on the genetic blueprints discovered. These molecules can then be tested against the potential health outcomes, paving the way for the discovery of biomarkers and novel therapeutics

Transforming Precision Medicine, Mekonos Case Studies



- Mission-Driven Team Committed to Make Precision Medicine accessible through a scalable delivery platform
- With IP from Stanford's stem cell research lab, Mekonos is building SOC (System-On-A-Chip) that will enable precise molecular delivery in gene editing and synthetic biology
- 2022 Nobel Prize Winner in Chemistry (Dr. Carolyn Bertozzi) is an scientific advisor for the company
- Carolyn Bertozzi on Precision Drug Delivery :
“doing chemistry inside living patients to make sure drugs go to the right place and not to the wrong place.”

BitBio : Reprogramming the Future of Synthetic Biology



From Left : Florian Schuster (BitBio's Co-founder, CFO), Rick Klauser, Mark Kotter (BitBio's founder, CEO)

- Mission-Driven Team from Cambridge University Committed to tackle the Stem Cell Manufacturing Challenges
- Based on the Nobel-Winning Yamanaka transcription factors, BitBio's OptiOx platform enables precise cell reprogramming, revolutionizing clinical research and drug discovery
- Rick Klauser (Altos Labs, National Cancer Institute, CAR T-Cell Therapies) on BitBio's investment : "In November 2019, Mark showed up at Lyell and started showing me his beautiful data. I walked out and told my assistant to cancel the morning. It only took four hours for us to decide to write him a check."