Introduction to Autonomous Agents and Auto-GPT

Alexandre MORITZ

Google Munich | 26/04/2023

Hacking Machine Learning Meetup

About me

- Master’s Degree in Computer Science
- PhD in Industrial Engineering
- Worked in the semiconductor industry for 4 years
- Organizer of the Kaggle Munich Meetup

- Open to new opportunities

Why I want to talk about Autonomous Agents?

- Doesn’t cost so much: 2/3€ per day
- Easy to set up
- Great increase of productivity!
- Big Opportunity!

Outline

- Quick intro to GPT
- Autonomous Agents?
- Popular examples of Autonomous Agents
- Focus on Auto-GPT & Demo!
- Business ideas
- Take away!

Quick Intro to GPT

- Language models, predict the next words
- GPT-4, very good at reasoning tasks
- Need to push the AI to give more information
- Doesn’t solve your problem in the real world

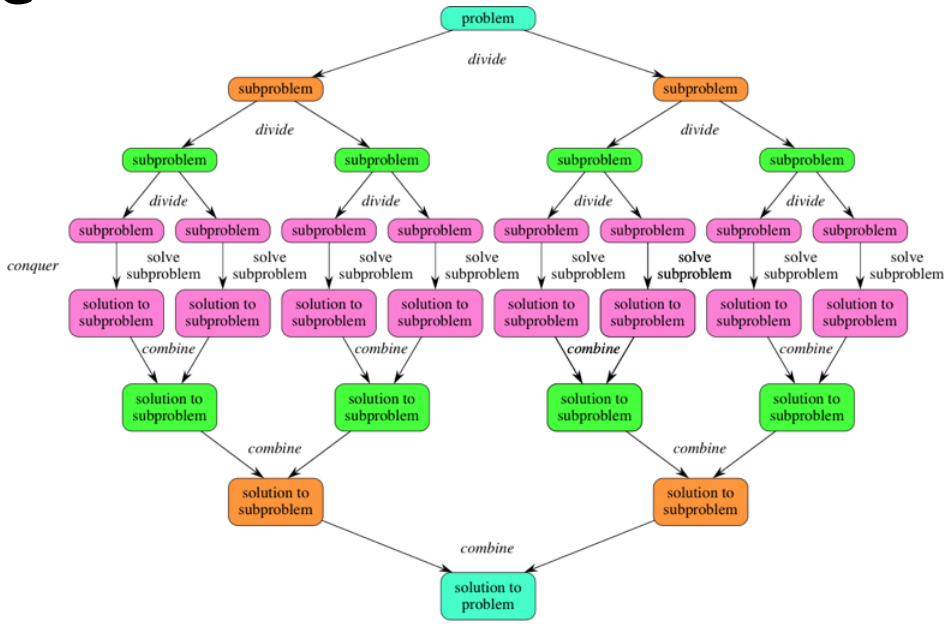
https://chat.openai.com/

Autonomous Agents?

- AI programs that will follow an objective

- Use the divide and conquer strategy

- Powerful and will improve quickly

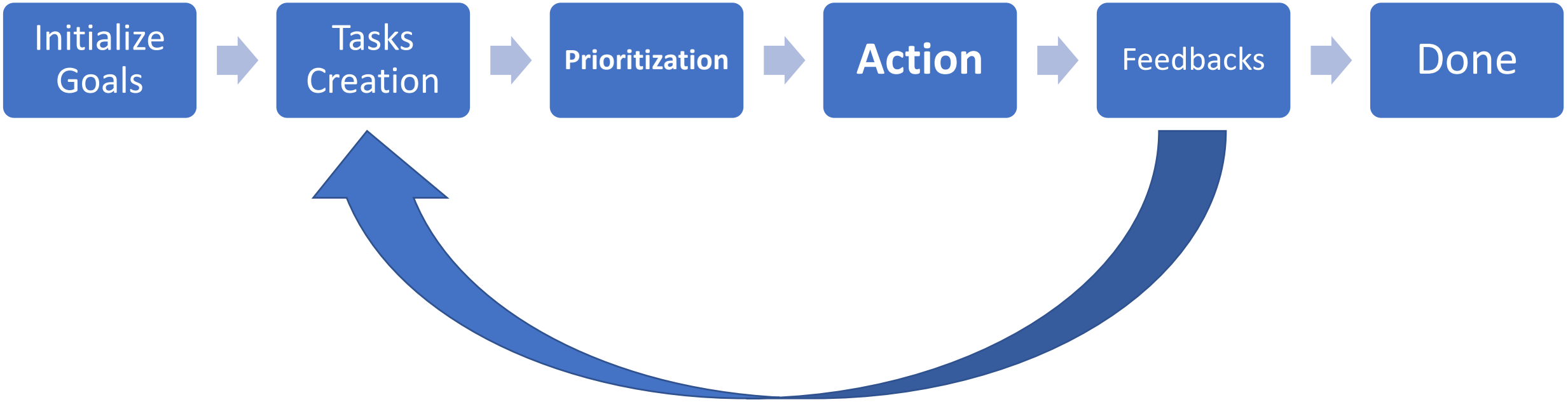


Khan Academie CC-BY-NC-SA

Based on plugins

- Browse the web
- Can write file, execute programs
- Use ML model for prediction, generate images
- Create twitter account, sends tweets…
- Create more agents!!

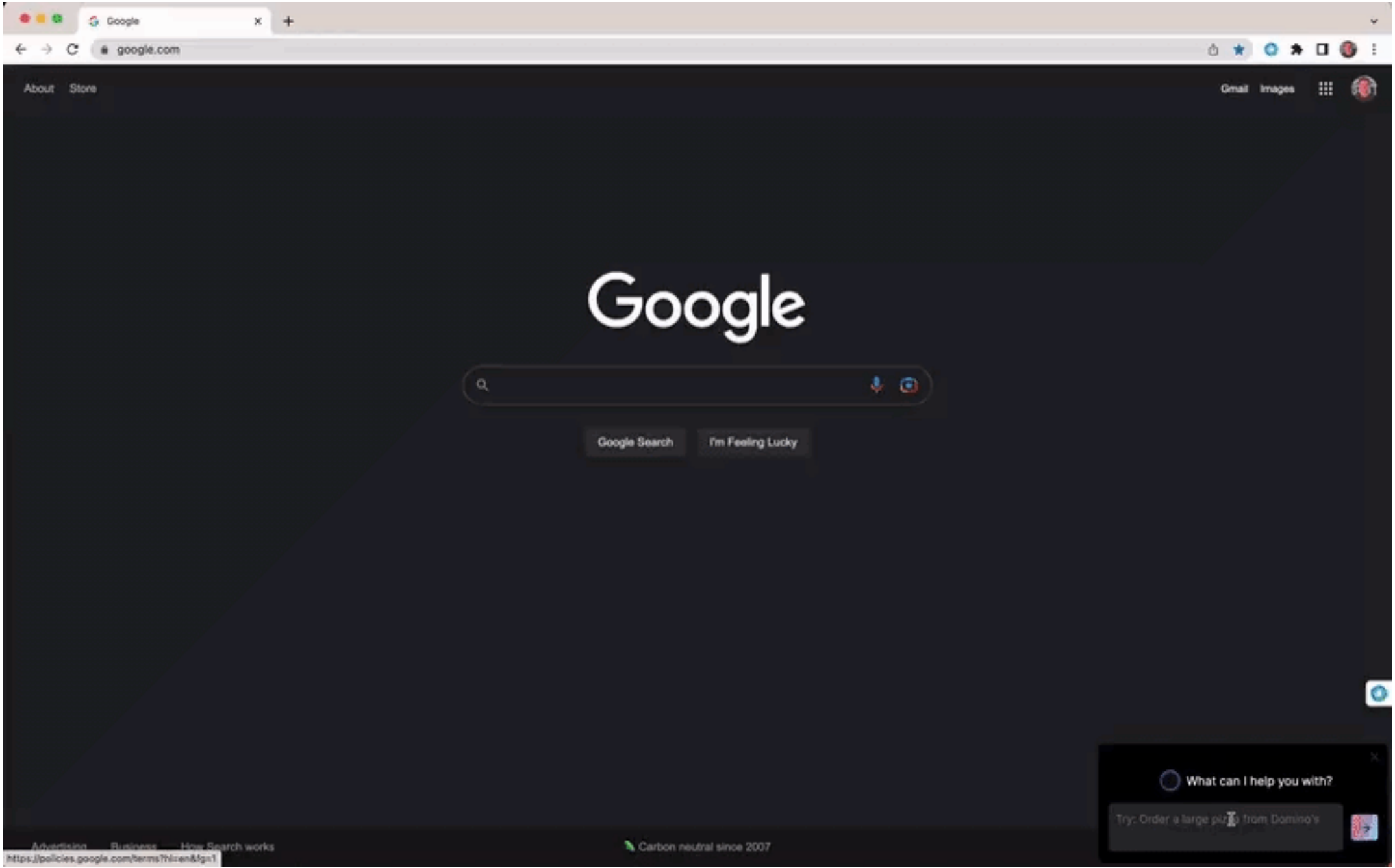
How does it work?



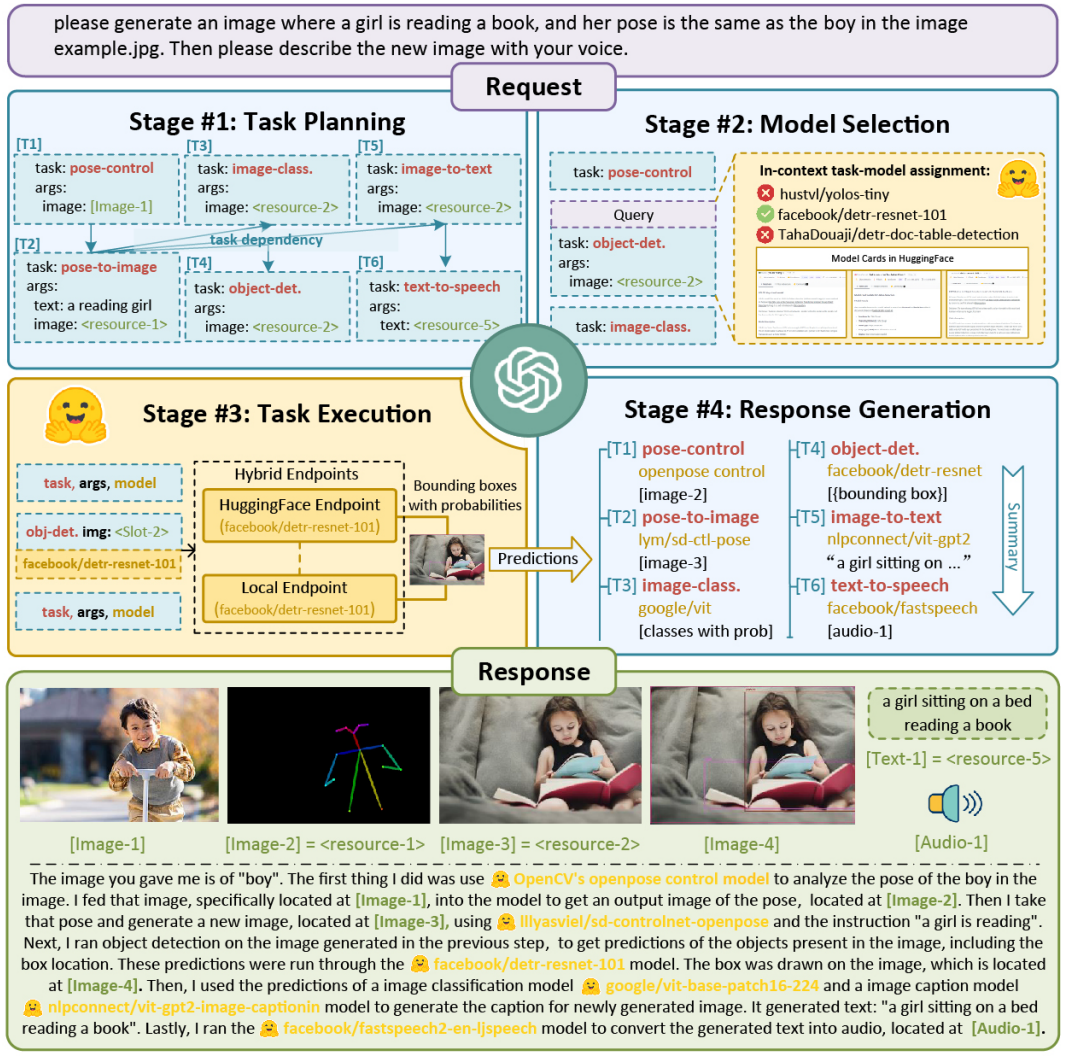
Example of Autonomous Agents

- HyperWrite
- HuggingGPT
- Auto-GPT
- …

HyperWrite's autonomous agent



HuggingGPT



Connect LLMs to AI models (In Hugging Face) -> solve AI tasks

Generative Agents: Interactive Simulacra of Human Behavior

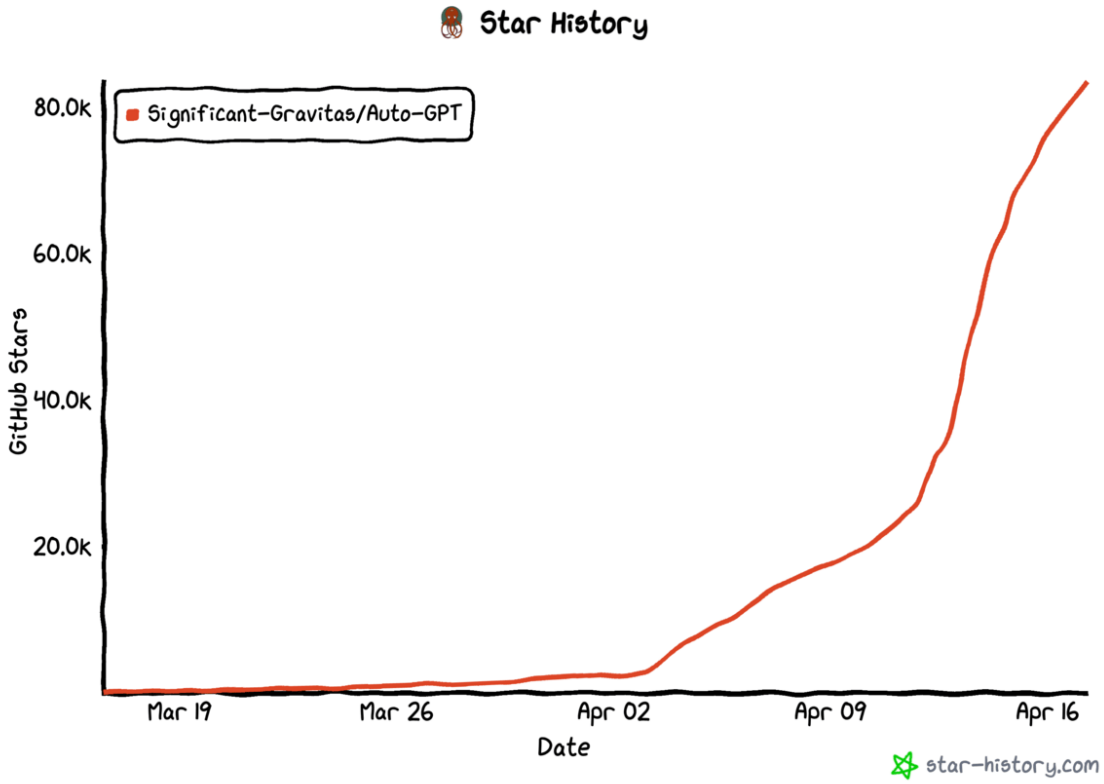
Virtual town of AI

Emergent social behaviors

Park, Joon Sung, et al. "Generative agents: Interactive simulacra of human behavior." *arXiv preprint arXiv:2304.03442* (2023).

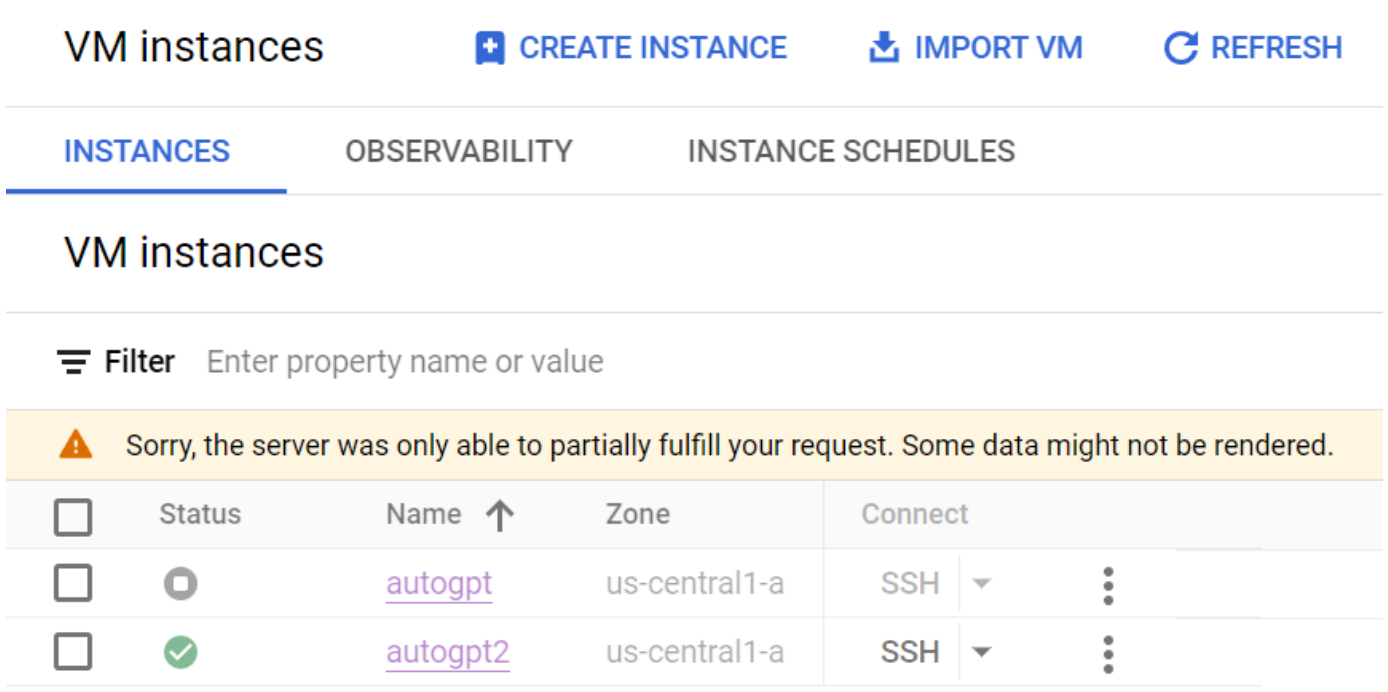
Auto-GPT

- More and more popular
- Already have some plugins
- Only need OpenAI API key and python
- And a goal!



Demo!

- Using a VM on GCP (e2-medium ~0.03€/h)



Feedbacks on Auto-GPT?

- Not perfect, can be stuck in a loop
- Need good prompt to start fast
- Promising results

Business ideas

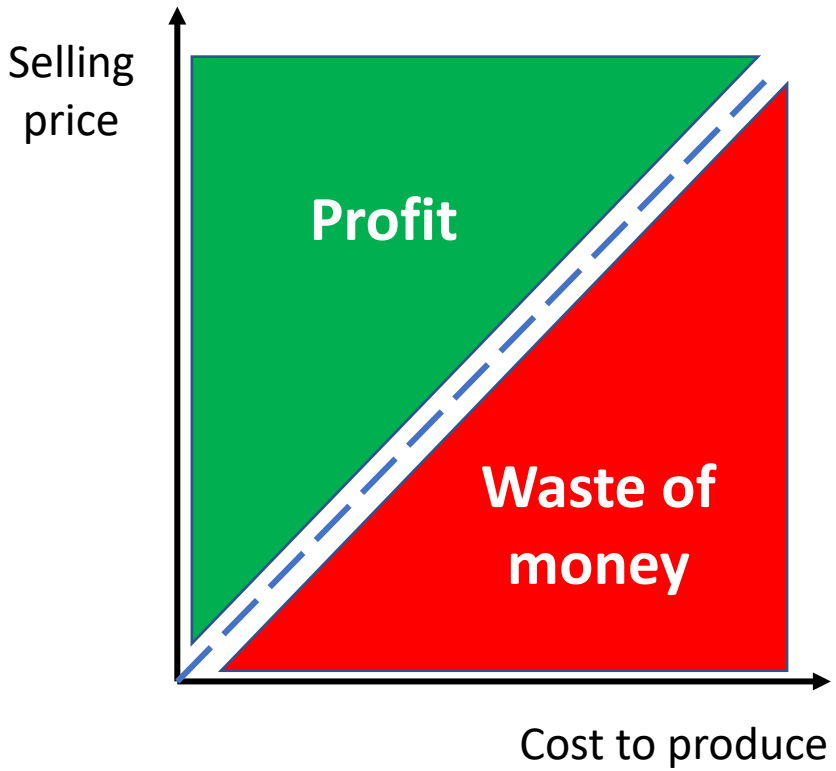
- Be friend with Sam Altman or Elon Musk -> open a business with them

Sam Altman

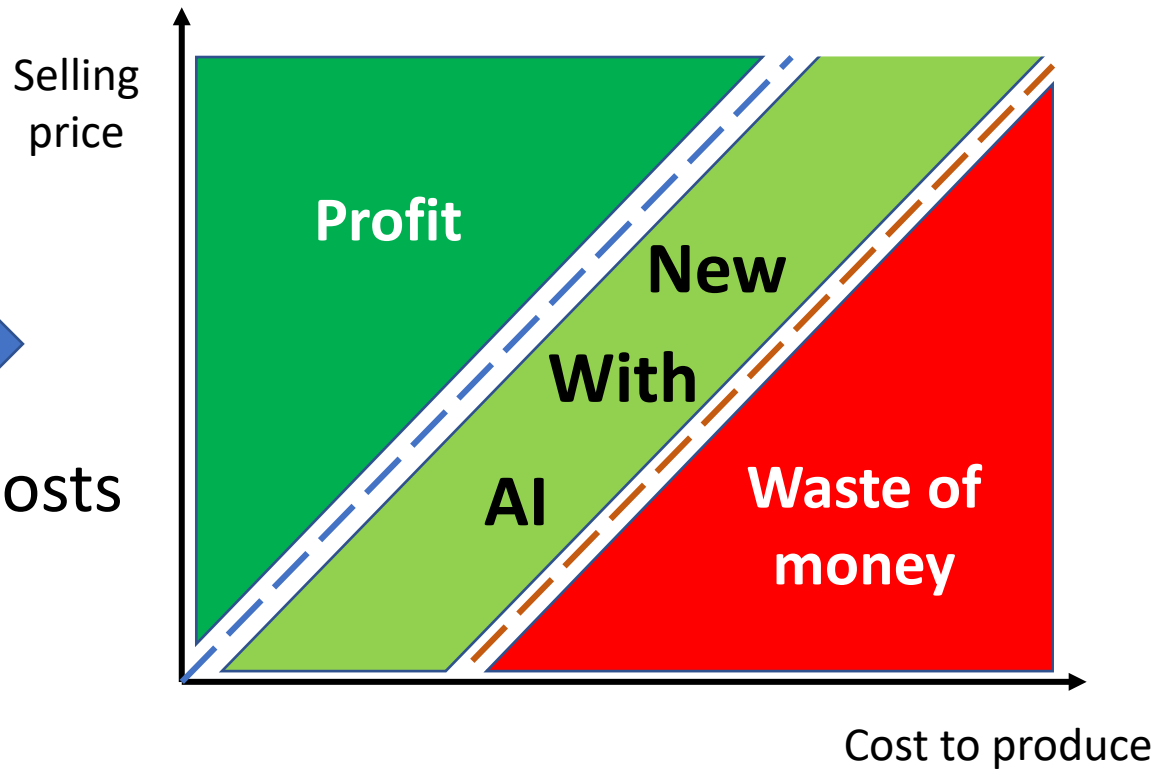
Elon Musk

- Be talented in AI and 50 millions € -> create your own AI (and sell API)

Business ideas (for most people)



AI decrease costs



Key points

- Focus on differentiation -> don’t do the cost race -> Niche Market
  - e.g. Personalized music/gifts
- Try yourself and test some ideas based on your experience
- AI is an exoskeleton. Be responsible!
- Don’t wait! How long before a society change?

Autonomous agents Use Case

Autonomous Agent Use Cases

Matt Schlicht, CEO of Octane AI

Personal Life
- Virtual assistants
- Smart home automation
- Fitness and wellness coaching
- Personal finance management
- Online dating and matchmaking

Manufacturing
- Quality control
- Predictive maintenance
- Process optimization
- Supply chain management
- Robotics and automation

Real Estate
- Property valuation
- Market analysis
- Virtual property tours
- Tenant screening
- Mortgage risk assessment

Gaming
- Game design and testing
- AI-driven characters
- Procedural content generation
- Player behavior analysis
- eSports coaching

Agriculture
- Precision farming
- Crop monitoring
- Pest detection
- Yield prediction
- Smart irrigation

Entertainment
- Content recommendations
- Virtual reality experiences
- Personalized advertising
- Social media monitoring
- Automated video editing

Healthcare
- Diagnosing diseases
- Personalized treatment plans
- Drug discovery
- Medical imaging analysis
- Virtual nursing assistants

Transportation
- Autonomous vehicles
- Traffic management
- Route optimization
- Logistics and delivery
- Drone navigation

Education
- Adaptive learning platforms
- Virtual tutors
- Learning analytics
- Plagiarism detection
- Career guidance

Finance
- Fraud detection
- Algorithmic trading
- Credit risk assessment
- Financial advising
- Portfolio management

Energy
- Smart grid management
- Demand response optimization
- Energy consumption forecasting
- Renewable energy integration
- Predictive maintenance of power

Human Resources
- Candidate screening
- Talent acquisition
- Performance analysis
- Employee engagement
- Training and development

Retail
- Inventory management
- Demand forecasting
- Price optimization
- Customer service chatbots
- Personalized recommendations

Legal
- Contract analysis
- Legal document review
- Case outcome prediction
- Intellectual property management
- Automated legal research

Public Safety
- Surveillance and security
- Disaster management
- Emergency response
- Crowd control
- Crime prediction

Real Environment
- Climate modeling
- Pollution tracking
- Wildlife monitoring
- Ecosystem management
- Natural resource optimization

Space Exploration
- Autonomous spacecraft
- Planetary rover navigation
- Mission planning and optimization
- Astronomical data analysis
- Satellite maintenance

Art and Design
- Generative art
- Architectural design
- Music composition
- Virtual fashion design
- Creative writing assistance

Journalism
- Automated news writing
- Fact-checking
- Sentiment analysis
- Trend prediction
- Social media analysis

Customer Support
- Chatbots and virtual assistants
- Sentiment analysis
- Ticket routing and prioritization
- Knowledge management
- Support analytics

Try yourself

- Quickly: AgentGPT https://agentgpt.reworkd.ai/

- AutoGPT Github: https://github.com/Significant-Gravitas/Auto-GPT

Q&A

Alexandre Moritz

Let’s connect & chat!

Ressources

- https://www.mattprd.com/p/the-complete-beginners-guide-to-autonomous-agents
- Generative Agents: Interactive Simulacra of Human Behavior
- HuggingGPT: Solving AI Tasks with ChatGPT and its Friends in Hugging Face