FITME

5 trillion dollars
- the size of the global apparel market,

Let’s start a revolution?

What’s the Idea?

1.5 minute video: https://www.youtube.com/watch?v=BU9FbpWt96Y

Text:
Huge apparel marketplace with breakthrough virtual clothing fitting **on the move**. Deep tech as it is.

Using his smartphone, the user scans himself and gets an accurate digital model of his own body. Then, in the app, the user chooses from a huge catalogue, perfectly fitting clothes, taking into account all his anatomical features and stylistic recommendations based on Big Data and AI.

Right in the app, on the product page, the user can see how the clothes fit the user **in motion** — with the ability to change poses, zoom in/out and rotate.

This kind of interactive personalization has not been implemented by anyone yet. There is an opportunity to fill this niche, but the technology, while seemingly simple, is technically challenging (really deep tech)

With such technology, the next step will be to create the largest clothing marketplace that competes with global giants (Amazon, Shein, and so on). The creation of a new strong player with disruptive technology will attract the attention of majors with the subsequent deal.

A bit of technique or how it is supposed to be done?

The technical core consists of three major aspects:

1. Creating a digital model of their body and face using a regular smartphone

2. Scanning clothes taking into account the properties of the fabric and accessories

3. Matching these data taking into account mutual compatibility in size and style on a moving three-dimensional model

Separate teams of engineers will be formed to develop blocks 1 and 2 and for future parallel work. Once a clear result is achieved, the teams will be transformed into a single block for the unified task of mutual integration of human and clothing behaviour data.

The development process can evolve along principled two approaches, the optimality of each will still need to be determined in practice.

The first approach is mathematical, when “algorithms” are embedded in the technology and the system builds a model of clothing / a person / clothing on a person in motion, calculating it based on calculations and algorithms (not data) + rendering is done in real time. An analogy illustrating the approach is a computer game, when the characters' movements are calculated by the game “engine” on the fly (Unreal Engine as one of the most famous) depending on the circumstances in the game. The calculation and rendering is done on the computing power of the end user, which can make it somewhat difficult to use this approach on weak smartphones. But nevertheless, having a specific narrow task allows this option to be considered quite realistic.

The second approach is generative artificial intelligence (AI)
That is, the neural-network model will be trained on how a person behaves in principle: kinetics and biomechanics. How different clothes behave on a person (how they stretch, fold, etc.). And then, having visual experience, it can generate media for the task — how these clothes will fit *a person*. On paper, everything seems simple, right? In fact, this is where the important difference from the so-called mathematical approach lies: it will be necessary to train the model to understand human movements (correctly approximating what the user did not present) on a huge array of different real people (from 5,000 people), filmed in a specific laboratory detailed capture.

Similarly, it will be necessary to train the model on how the most diverse clothes behave on various people. Both those that fit and those that do not. For this, both the different people themselves and a huge number of the most diverse clothes are also needed.
For all this, a decent offline component is already needed: organising a laboratory for training on live examples. The only good thing is that there are no special requirements for the authenticity of the clothes, that is, for training you can use some stock/second hand, obtained in large quantities just by weight.

Thus, the model will learn how different clothes behave on different people, and then it will be possible to ask specific questions — here is such a person and such clothes, how will it be, show! And the model, based on its experience, reproduces the combination of these data in motions with a possibility to interact with the user's model.

Another important component is stylistic: how clothes go together, what colors, styles, how it suits a specific person and under what request. There is an idea to upload a huge set of some generally accepted images in the target culture into virtual brains — from movies, TV series, videos from everyday life and thus teach the machine to understand "what is good and what is bad". The good news is that this block can be skipped for now to test the hypothesis, implementing this logic later, on top of the already working technology.

For those who still think that “everything is simple and why hasn’t anything been done yet”, there are several interesting questions: zippers, layers of clothing, hands in pockets/not, hoods, bags (there are a lot of options for wearing) - well, and a combination of all this. And it is also extremely important to be careful with a user’s face. Users in the application should like themselves, while remaining similar to themselves.

The division of these approaches (mathematical / AI) is in some sense arbitrary.
It will not be possible to do without mathematics, without preliminary calculations, or without any artificial intelligence in any scenario. Therefore, the optimal path will be determined based on the results of the research phase — 7 months.

Licensing considerations affecting the development costs.

We cannot use something that’s already ready-made like the Unreal Engine or existing generative AI models that create images/videos etc., otherwise we become dependent on existing licensed technologies, and in case of large-scale commercial exploitation this may be unsafe for the established business.

Similarly, a huge issue arises when selling the company.

That's why it will be necessary to develop our own unique solution, in a sense a mix of our own Unreal Engine, Midjorney, DALLE and Stable Diffusion, just so that everything is fine with hands and fingers (the problem of modern models is the visualization of human fingers, it's complicated). You can imagine how much money Microsoft and other majors spent on creating their models.

The good news is that our task is much more concrete and specific,and there will be more prepared data for the input than the user's text query. Therefore, the probability of success in technical terms exceeds **70%**.
Let's talk about the risks in more detail.

Risks

Technical risks
No one before us has seriously puzzled over the things the way we want to do them. The video component is what appears difficult. Current competitors' products work in 2D according to the principle of drag-and-drop the clothes to the flat image of the end-user — no one offers three-dimensional (3D) real interactive interaction of clothes with a detailed digital image of a person and layers of clothes in motion.

On the way to implementing this process, we may face the fact that the current computing power of modern hardware will not be enough to generate video content with a person in new clothes at a comfortable speed for an end-user, i.e. on the fly — rendering can take a lot of time, and if we consider that the potential number of users grows exponentially, this can create difficulties when high-quality "video" must be given out very quickly and to everyone. This question can only be answered surely by immersing seriously into the development. There may be manoeuvres that will allow us to take shortcuts, such as pre-calculated general models, etc., but we need to delve deeper.

The second infrastructure problem that can be faced is the limitation on the data transfer speed. In practice, it looks like the video (a three-dimensional animated model of the end-user of photographic quality with the possibility of breakthrough interaction) is delivered to the device slowly — since the video content weighs a lot, and is also generated ad hoc, and transferring it in parts (background loading as in YouTube) in this case will not work — look at yourself without feet, yeah.

Considering the growth of mobile Internet speeds in large cities, this is not such a serious problem, but we can also run into this limit for some time, overtaking time. However, having research capabilities it can be worked with. There are ideas on how to optimize the volume of transmitted data in order to partially visualize the avatar on the user's device.

The stated infrastructure problems are promised and can be solved, but a real understanding of the premise is required — theoretical calculations do not always meet reality accurately.

It is important to understand that the technology is, after all, complex and multi-component (despite the fact that it is possible to explain everything in a highly abstract way), otherwise it would have been implemented and introduced by some other giant or startup long ago. But at the moment there is silence, there is no real technology in commercial use on the market.

Business risks
While we are thinking and talking about it, some company like Amazon with its endless resources will do all this ~~instead of us~~ and then the point of this activity will be multiplied by zero.

The team

The author and visioner — Vitaly Borshchevsky.
Was born in Saint-Petersburg, Russia.
In 2020 moved to Israel, now living in Tel-Aviv.

A software developer by first education, was already developing at the age of 9. In 2006 I founded a software development company and do the big e-commerce solutions. Relevant projects would be below.

It is easier (for me) to create a technology core with my mainly Russian team, it would be optimised for budget and more effective.

In Saint-Petersburg I have access to faculty of AI and computer vision in ITMO University. Also with the professors of The Bonch-Bruevich St Petersburg State University of Telecommunications I have access to talented students we will definitely need.

In Israel we can have a HQ to have a possibility to call in Israel Startup to enter on the global market. But in the current reality, not everyone is ready to work with the Israelis either, anyway it's not a problem, we will find our brave investor.

Roman

Commercial development experience — 23 years
Core expertise is e-commerce (retail, services), marketplaces (development and integration).

PHP, C#, node.js, dart, bash
PHP-frameworks: Zend Framework, Symfony, Yii, Laravel
Databases: MySQL, MSSQL, PostgreSQL, ELK (Elasticsearch, Logstash, Kibana), Redis, MongoDB
Environment: *nix системы (Debian, Ubuntu), Apache, Nginx
Front: pure html, css, js, фреймворки: React, Tailwind, Bootstrap

Alex

The expert in fields of AI, algorithmic information theory and computer vision.
Full professor and researcher in ITMO University and Saint-Petersburg State University (2006-2019). Head of Intelligent computer vision research lab at the Vavilov State Optical Institute (2008-2014).
Two Kurzweil Best awards at AGI'18

- Development and implementation neural-symbolic frameworks for dialog systems and AI agents.

Main science interests:

- Artificial general intelligence, algorithmic information theory, machine learning, computer vision, probabilistic programming
- More than 150 publications, 3 books, and 5 PhD students defended their theses.

Key expertise:

- Algorithm development for image recognition systems, robots and multifunctional systems.
- Development of image analysis and pattern recognition systems in high-performance video-applications.

Sergey

Expert in AI and neural-symbolic systems

- Graduated from East European Institute of Psychoanalysis (St. Petersburg, Russia), Master Degree in Cognitive Science, 2007
- AI project chief in Hanson Robotics and SingularityNET (2018–2023)
- Intelligent Infocommunication Systems Scientific Center curator at SPbSUT University (St. Petersburg, Russia), head of Neurocognitive Systems Lab (2016–2023)
- Strong Artificial Intelligence, 2021, co-author
- Cognitive Architectures, dialog systems and perceptual pipelines for android robotics and virtual avatars;
- Large-Scale AI/AGI driven computing systems design;
- Artificial general intelligence, neural-symbolic architectures, machine learning, natural language processing, large scale language modelling, human-machine hybridization networks, artificial Psychology.

Kirill

Expert in AI, blockchain, networks and education

- Management of R&D projects, development of innovative solutions in AI, IoT, and telecommunications.
- Leadership, management and coordination of R&D projects in AI areas of science, internet of things and telecommunication.
- Creation, maintenance of the material base, organization of the learning process at the Huawei Authorized Information and Network Academy HAINA Academy at St. Petersburg State University of Technology.
- Startups management and prototype development for network infrastructure.
- Deep expertise in data-centre creating for neural-network calculation and AI-solution implementation to real business-processes.

Vitaliy

Expert in fields of software development, AI and cyber security

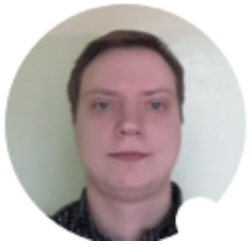
- Java, C/C++, Rust and Go in AI-projects and network technologies.
- Participation in creating OpenCog and Hyperon — solutions for AI and SingularityNET platform development.
- Project management for banking and fintech development solutions, includes servers architecture and blockchain.
- Deep experience in fields of telecommunication and network hardware, includes automotive testing and simulation systems.

Dmitry

Expert in digital signal processing, embedded system and machine learning

- Associate professor, vice-head for research activities of the department of automation and control processes, head of the laboratory of real-time signal processing and computer vision in St. Petersburg Electrotechnical University "LETI".
- Full professor, artificial intelligence research institute, China University of Mining and Technology.
- Research Professor, Faculty of Information Technology, Kazakh-British Technical University, Almaty, Republic of Kazakhstan
- Design, research and development of control devices based on Atmel and Microchip microcontrollers (AVR, ARM).
- Research and development algorithms for RF-based systems.
- Main research and industrial projects of the laboratory related to digital signal processing, embedded computing, computer vision, industrial automation.
- Teaching experience and scientific leadership experience and author of over 100 papers.

Maxim



Expert in computer vision, machine learning and robotics

- R&D in SingularityNET since 2018.
- Professor and researcher in field photonics in ITMO University, Saint Petersburg, (2008-2018).
- Participated in LG Electronics projects in the field of vacuum cleaner navigation (computer vision) and in face recognition projects for Cisco and Hanson Robotics (Sophia the robot).
- Machine learning methods, computer vision and image processing methods.
- Python (Pytorch, OpenCV), C/C++, ROS, MATLAB.

There are the best of the best. I also have a lot of connections with many talented specialists to work with for MVP development. Some people will be available for us only like external consultants, because they are not ready to leave their current warm positions in any way.

Relevant e-commerce projects completed by the team

Among our clients is Ulmart — sales of $1.3B in 2014. All automation of company processes, development and support of the website (200,000 visitors per day), online advertising

Another major customer in the portfolio is Blumart, a chain of construction hypermarkets in Moscow. In fact, the largest plumbing store in Moscow. Before us, the customer had already been working for 8 years. After the start of cooperation, we took on the automation of processes, bringing order and introducing innovations just like in our own business. The company has grown five times — from one store to 5 hypermarkets of plumbing and tiles, with a total area of over 35,000 m2. Monthly sales have increased 7.5 times since the start of cooperation, with revenue growing by 50% every year.

Similarly, there are many less-known, but no less profitable in aggregate, online stores and online solutions created by our team:

Energoboom — online store of household appliances and electronics (5 people on staff, everything is automated, turnover at peak 100M / m),
JUST.ru — online store of electronics with an assortment of 100K+ SKU
www.rozetka39.ru — regional online store of electronics and household appliances (6 offline stores)
partsdirect.ru — online store of spare parts for electronics, launch of a full-fledged business in 61 days, from idea to first order.
123.ru — online store (electronics, home appliances, power tools) and chain of stores oldi.ru - online store (electronics, home appliances, power tools) and chain of stores elektro-park.ru - online store of electronics and home appliances
kidstore.ru — online store of children's goods
noteberry.ru — online store of electronics and home appliances
mirdiscont.ru — online store of electronics, home appliances, power tools
nou-hau.rf — online store of mobile electronics and chain of stores
bclean.ru — similar to uber in the cleaning industry
1e3f.com — c2c site of electronic goods and services for resale
cashback.market - b2c site for price comparison + cashback service based on the largest cashback operators (Admitad, Actionpay, Gdeslon)

We are still working with many of the people we started working with in 2006.
The team has been established, the last dismissal was in November 2023.

Finance

We need a lot, but not right away.

The R&D phase, that is, the development of a stable working prototype, will require **~18 months** and up to **5 million dollars**.

After the product is created, we will need much more money: for marketing and infrastructure to create the largest marketplace (warehouses, people, process automation, integration with factories,). The marketing budget largely depends on which market to launch in. If it is the States (NY) — it's one scale, if the local market to test like Singapore/Hong Kong/Bangkok or even Israel — it is another scale.

We'll touch on this later, but for now the task is to get a stable working technology (MVP).

The people on the team will need an office. I insist that development is carried out as NOT remotely as possible. Come and work offline, only few people can work properly from home.

Additional application prospects

In addition to the obvious way to capitalize on the technology - the revolutionary online apparel marketplace that will revolutionize the shopping industry, the working technology for scanning and visualizing a person can be used in other areas.

This includes aesthetic medicine (including plastic surgery).
And all kinds of online wellness/fitness: tracking user's shape and correcting exercises. Film production.
Marketing — we will have data about people and their preferences.
Besides, the data set itself with digitized people (collected before real users) may already have commercial potential — high-quality digitized 3D models of people are not currently available on the market.
Security. Having biometric data of a large number of people in dynamics, in a sense, is of great value.

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