

## Task-1

### Trends of A.I and M.L in Russia:

1. A.I is expected to revolutionize the Russian e-commerce and retail business. A.I is being widely adopted into marketing and strategic planning. This [article](#) gives more insights on how A.I impact the Russian markets in the next 3-5 years.
2. A.I research for autonomous cars is one of the top research interests of global tech companies. Russian tech companies are widely working to build a stable and safe autonomous vehicle with some of the recent advancements in object detection, etc.
3. Low code or no-code A.I is revolutionizing all industries by enabling small and medium scale companies to use A.I in their products with neither building nor training models but just deploying right away into production. One of the very good examples of this kind is [google's teachable A.I.](#) Russian companies are working on this sub-field.
4. A.I in cyber security is in intense research across the globe. Various teams of Yandex, Baidu, MAANG companies are investing to build robust models.
5. A.I in digital marketing and advertising. Many recent algorithms have out-performed all the older algorithms that were used in online advertising and marketing strategies. Tech companies are building much stronger versions of these models in Russian and other countries.
6. A.I and Metaverse for 3D creation in Gaming companies across the globe including Russia.

### Innovations and services of A.I:

1. Low code or no code A.I to enable small and medium scale industries to use A.I in their products with neither building models from scratch nor training with extensive computational resources.
2. A.I in predicting and analyzing the structures of proteins. Understanding a protein of a virus and its structure is very important to develop an antidote that can fight against viruses. Understanding the structure of a protein requires lots of time for scientists but models like alphafold from google's deep mind can do them accurately in much less time.
3. Creative A.I as social marketing and advertising technique. Creative A.I is one of the most fascinating research areas to work in. Some of the companies are using Creative A.I along with neuro marketing, aesthetic prediction systems to develop their businesses with cool advertising techniques using Creative A.I. [This article](#) gives more insights.
4. A.I in document processing applications. Document intelligence (D.I) is the top research interest of consulting companies such as EY. D.I applications with recently proven algorithms are widely adopted by various educational institutions, tech and non tech service providers, investors to process documents such as resumes, scholarship applications, funding applications for finding the best choice.
5. A.I models for 3D content creation to improve gaming experience with a realistic environment. Companies like Nvidia are extensively investing to bring better A.I algorithms to create 3D content as realistic as artists do.

Algorithmics details and references:

1. Fundamental algorithms of deep learning with advanced concepts like Convolutional NN's, Advanced Recurrent NN's such as LSTM, Attention. Bert models are used for various components in applications of low code or no-code A.I. This is an example of A.I for businesses i.e., to enable small and medium companies to include A.I applications in their products without much funds. This area comes under providing organized services to small companies that were never before provided with such an opportunity to use A.I in custom products and services i.e., Business to Business. The Github resource to the [teachable A.I](#) (a no-code A.I application from Google) is [here](#).
2. The model is built using Convolution NN for 3D images. Some of the fundamental concepts of deep learning like NN are used along with some of the computational techniques/formulas traditionally used to find the protein structure manually with [X-ray crystallography](#). The Github resource to the actual model is [here](#). The papers published in nature by the deep mind team is [here](#). The application comes under innovation in Business to Business service. These models can be used in scientific research labs to fasten the understanding of any novel proteins and initiate further steps.
3. These kinds of tasks use generative models like AVE's (Autoencoders and decoder), GAN's (generative adversarial neural networks) along with composition preserving methods such as [multi-level spatial pooling operations](#). The basic concepts of deep learning such as CNN architecture is used. The Github resource to this is [here](#). The paper associated to GAN architecture is [here](#). The application comes under Business to Business since it can be used by any organization/companies to advertise products, services or programs to a bigger community with fewer efforts. This can also be used in VFX for films.
4. D.I (Document Intelligence) uses special kind architecture such as deep information extracting context-free grammar to recognize and understand the importance of various components on a document. The corresponding paper is [here](#). The Github resource is [here](#). This application comes under Business to Business as this product can be helpful to all the organizations, institutions, companies that process documents such as applications for fundings, scholarships, and resumes.
5. The 3D convolutional neural networks are used along with 3D pooling operations in special kinds of generative architectures such as GAN's and VAE's. The fundamental concepts of deep learning are used with simple statistics. The Github resource is [here](#). The renowned blog from Nvidia on 3D content creation is [here](#). This application comes under Business to Business since these can be incorporated by any gaming company to enhance 3D creation with less human effort and without any tradeoff with the aesthetic sense of graphics.

Some of the other resources: 1. Protein folding: [Intro to Deep mind's Alphafold](#).

2. Creative A.I: [Creating attractive fake content](#).