интенсификацию работы государственных СМИ Республики Беларусь на площадках «Twitter», «Facebook», Телеграмм-каналов и продвижение белорусскими СМИ в аккаунтах информационной повестки, включающей в себя следующие тезисы: а) беспрецедентно грубый и агрессивный характер протеста, с демонстрацией его участниками явного пренебрежения законом и нормами морали; б) поддержка белорусской оппозицией тесной связи со спецслужбами иностранных государств и ее действие, как правило, в их интересах; в) искреннее желание обычных жителей, большинства политиков и бизнесменов к прекращению протестов, а также их требования в отношении справедливого наказания для инициаторов протеста и ужесточения законов о митингах и демонстрациях; г) толерантность действий органов правопорядка по отношению к протестующим, по сравнению с действиями полиции в ряде западных стран. Важное значение может иметь вовлечение в пропагандистскую работу по направлению антипротестного движения лидеров общественного мнения и тиражирование в социальных сетях постов белорусских звезд, актеров, музыкантов и известных предпринимателей, выступающих в поддержку единства белорусского народа.

Резюмируя изложенное, представляется необходимым сформулировать следующие выводы.

Во-первых, фактор обращения лидеров современного протестного движения к потенциалу социальных сетей свидетельствует об их стремлении к учету в своей деятельности по сути дела безграничных возможностей сетевых технологий и достижению минимизации «заградительных мер» технического порядка со стороны официальных государственных структур.

Во-вторых, массированное онлайн-воздействие на сознание и поведение белорусского народа со стороны отмеченных информационных центров требует адекватности и наступательности контрпропагандистской работы по дезавуированию деструктивных замыслов интересантов белорусской нестабильности.

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Machine Learning in the context of AI, current state of affairs

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doi: 10.18411/lj-01-2021-15

idsp: ljjournal-01-2021-15

Аннотация

В первой части научной работы осуществлен общий обзор направления – Машинное Обучение в рамках исследования ИИ, – описана актуальность темы, сформулированы базовые теоретические аспекты. Дальнейшая часть работы посвящена

модельному подходу к рассмотрению основных подклассов Машинного Обучения: т.н. обучение с учителем (от англ. Supervised), обучение без учителя (от англ. Unsupervised) и обучение с подкреплением (от англ. Reinforcement). Концептуальное описание принципов работы ключевых алгоритмов представлено к рассмотрению. В заключение подведены итоги, сформулированы субъективные выводы по теме исследования.

Ключевые слова: машинное обучение, искусственный интеллект, предиктивная аналитика, обучение с учителем, обучение без учителя, обучение с подкреплением.

Abstract

In the first logical part of the work, general look on the field – Machine Learning in the Artificial Intelligence's context – was given, relevance of the subject rationalized, foundational theoretical assumptions postulated. Consecutive parts were dedicated to the modular overview of the popular subclasses of Machine Learning algorithms: Supervised, Unsupervised, Reinforcement; a more detailed conceptual descriptions on the algorithms offered for consideration. Finally, subjective conclusions had been formulated on the subject of the research.

Key words: Machine Learning, Artificial Intelligence, predictive analytics, supervised learning, unsupervised learning, reinforcement learning.

Machine Learning (ML) algorithms are everywhere. Providing you've ever used nowadays ubiquitous Search Engines (Yandex, Google etc.), which, to recite prominent modern thinkers, «have become our second brains», chances are, you're heavily reliant on the intricate workings of contemporary ML implementations. Music tastes (Spotify); transportation or shopping experiences (Uber, Amazon); even One's love preferences and romantic matchmaking affairs (Tinder) – Machine Learning became the game-changer, which drives live patterns of everyone, all over the world, regardless of their own acknowledgment of this fact [1].

According to one of the leading employment agencies in the world, there is an unprecedented rise in demand for ML specialists in the market (table 1). With an average yearly salary of almost \$150,000 and significant 344% growth in job postings, ML engineer is a new extremely promising position [2].

Table 1.

Rating of the employment market's demand (USA, 015-2019)

Rank	Job Title	% growth in the number of postings	Average monthly salary	Job Title's # of postings per 1 mil. total jobs
1	Machine Learning Engineer	344%	\$12,173	179
2	Insurance Broker	242%	\$7,208	32
3	Full-stack Developer	206%	\$9,535	828
4	Insurance Advisor	190%	\$6,790	45
5	Litigation Associate	168%	\$8,441	92

From scientific perspective, it's not even that important what major you got or which field you specialize in. There is high demand in the market for enthusiasts with breakthrough ideas all across the fields: for physicists who are trying to understand processes emerging inside the computationally complex systems; for biologists, who're meticulously slicing and dicing Neural Nets, seeking their inspiration in the brain machinery of living things; for linguists, whose aim is to untangle complexity of social relations through Natural Language Processing routines; for Supply Chain Managers, whose main aim is to constantly optimize material, financial and informational flows, trying to balance between sometimes highly subjective and contingent things, figurately speaking, as if professionally playing zero-sum

games with almost no information about the environment (where ML probabilistic Bayesian model implementations operate just right). There are algorithms to substantially ease almost any intellectual undertaking.

New wave of ML systems does not actually bring us intelligence but instead a crucial component of intelligence - prediction. Thus, the main idea behind Machine Learning is that such an algorithm could be written and implemented, that it'd optimally configure itself and make decisive predictions ad hoc in a totally new or unknown situation without explicit external inference, given the fact that it had been properly hyper-parameterized and trained, using appropriately preprocessed data and deliberate human expertise [3].

As it is often the case with science, there are totally different clusters of algorithms and methods with quite different takes in regard to how to teach the Machine to learn properly and what is the final objective of the Machine (pic. 2).

Picture 1 – «Roadmap» of the Machine Learning

As it was put priorly, although all of the methods have the same goal – to extract insights, patterns and relationships that can be used to make decisions – they have different approaches and abilities. Machine Learning approaches are traditionally divided into three broad categories (3-Fold Model), depending on the nature of the signal (proportion the value in the informational flow) available to the learning system [4].

1. Supervised Learning (SL).

Figuratively speaking, SL can be considered to be the true miracle of predictive modeling. As if educating a child, all one needs to do to get incredibly powerful predictive model at one's own disposal is to teach by the real examples: the algorithm is presented with example inputs and their desired outputs, given by a «teacher», and the goal is to learn a general rule that maps inputs to outputs (pic. 2).

Picture 2 – Supervised Learning (visual representation)

2. Unsupervised learning (UL).

In UL there are no labels given to the learning algorithm, leaving it on its own to find structure in its input (pic. 3). If with Supervised Learning operator (or programmer) can be seen as a caring parent, who's nursing his child, «explaining» the real world around to his procreation – it's all different with Unsupervised Learning (UL). UL models are basically «left to the mercy of fate» to find patterns and regularities (or irregularities) in the system where they function by themselves – and they work «like a clock».

Picture 3 – Unsupervised Learning (visual representation)

3. Reinforcement Learning (RL).

A computer program interacts with a dynamic environment in which it must perform a certain goal (such as driving a vehicle or playing a game against an opponent). As it navigates its problem space, the program is provided feedback that's analogous to rewards, which it tries to maximize (pic. 4) [5].

Picture 4 – Reinforcement Learning (visual representation)

Also, there are other less popular ML approaches, which don't fit neatly into the reviewed categorization. More than one approach could be used by the same intelligent system. For example, topic modeling, dimensionality reduction or meta learning [6].

Conclusion. Although there are quite a few caveats and limitations with contemporary implementations of Artificial Intelligence (from the Learning prospect), the field is dynamically evolving, or like it was put previously even «revolving» – rather radically, speaking in the context of the last years' progress. It would be hard even to imagine some 20 years ago that almost every enthusiastic «layman» interested in the field could leverage such tremendous amounts of analytical power using quite simple statistical algorithms – «entrance threshold» for the aspiring small companies to become truly data-driven plummeted rather substantially in just a few years as the consequence. Nonetheless, even though the progress cannot be overestimated, there are lots of things to be done, lots of equations to be transcribed and published, lots of patterns to be discovered.

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