

# Exame de Proficiência - PROFNIT/Unifesspa - 24/04/2021

- A prova contém 10 questões;
- Cada questão vale 1,0 ponto;
- Para ser aprovado (a), o (a) discente precisa tirar nota igual ou superior a 5,0 (segundo as mesmas normas de aprovação da Unifesspa);
- A duração da prova é de 1 hora;
- A prova é individual e SEM consulta;
- O gabarito será enviado até o dia 26/04/2021;
- O resultado será apreciado em reunião da CAI (07/05/2021) e disponibilizado em [www.profnit.unifesspa.edu.br](http://www.profnit.unifesspa.edu.br).

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Texto 1

## **Artificial intelligence (AI) helps identify new key-lock pairs against coronavirus**

The human immune defense is based on the ability of white blood cells to accurately identify disease-causing pathogens and to initiate a defense reaction against them. The immune defense is able to recall the pathogens it has encountered previously, on which, for example, the effectiveness of vaccines is based. Thus, the immune defense is the most accurate patient record system that carries a history of all pathogens an individual has faced. This information however has previously been difficult to obtain from patient samples.

The learning immune system can be roughly divided into two parts, of which B cells are responsible for producing antibodies against pathogens, while T cells are responsible for destroying their targets. The measurement of antibodies by traditional laboratory methods is relatively simple, which is why antibodies already have several uses in healthcare.

### **AI helps to identify new key-lock pairs**

T cells identify their targets in a key and a lock principle, where the key is the T cell receptor on the surface of the T cell and the lock is the protein presented on the surface of an infected cell. An individual is estimated to carry more different T cell keys than there are stars in the Milky Way, making the mapping of T cell targets with laboratory techniques cumbersome.

Researchers at Aalto University and the University of Helsinki have therefore studied previously profiled key-lock pairs and were able to create an AI model that can predict targets for previously unmapped T cells.

"The AI model we created is flexible and is applicable to every possible pathogen - as long as we have enough experimentally produced key-lock pairs. For example, we were quickly able to apply our model to coronavirus SARS-CoV-2 when a sufficient number of such pairs were available," explains Emmi Jokinen, M.Sc. and a Ph.D. student at Aalto University.

### **A new life for published data with novel AI models**

Tools generated by AI are cost-effective research topics.

"With the help of these tools, we are able to make better use of the already published vast patient cohorts and gain additional understanding of them," points out Harri Lähdesmäki, Professor of Computational Biology and Machine Learning at Aalto University.

Using the artificial intelligence tool, the researchers have figured out, among other things, how the intensity of the defense reaction relates to its target in different disease states, which would not have been possible without this study.

"For example, in addition to COVID19 infection, we have investigated the role of the defense system in the development of various autoimmune disorders and explained why some cancer patients benefit from new drugs and some do not", reveals M.D. Jani Huuhtanen, a Ph.D. student at the University of Helsinki, about the upcoming work with the new model.

Fonte: Adaptado de <<https://www.news-medical.net/news/20210423/Artificial-intelligence-helps-identify-new-key-lock-pairs-against-coronavirus.aspx>>. Acesso em: 23 abr. 2021.

4. De acordo com o Texto 1, marque a alternativa correta \*

1 ponto

Marcar apenas uma oval.

- Usando a ferramenta de inteligência artificial, os pesquisadores descobriram, entre outras coisas, como a intensidade da reação de defesa se relaciona com seu alvo em diferentes estados de doença.
- Muitos algoritmos de IA são capazes de aprender com os dados; eles podem se aprimorar aprendendo novas heurísticas (estratégias, ou "regras práticas", que funcionaram bem no passado), ou podem eles próprios escrever outros algoritmos.
- O aprendizado de máquina (machine learning), um conceito fundamental de IA desde o início do campo, é o estudo de algoritmos de computador que melhoram automaticamente com a experiência.
- Com a ajuda dessas ferramentas, não se pode fazer melhor uso das vastas coortes de pacientes já publicadas e não se pode obter um entendimento adicional sobre elas

5. Qual é a sua resposta e a sua justificativa para o título do texto: "Artificial intelligence (AI) helps identify new key-lock pairs against coronavirus".

1 ponto

Responda, em português. \*

Possível resposta:

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Inteligência artificial (IA) ajuda a identificar novos pares de fechadura contra o coronavirus. A partir da leitura do Texto 1, pode-se concluir que a Inteligência artificial é uma ferramenta que pode ajudar a identificar novos pares de fechadura contra o coronavirus.

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6. Comente a relação entre inteligência artificial e doenças, de acordo com sua compreensão do Texto 1. \*

1 ponto

Possível resposta:

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Um novo método de inteligência artificial (IA) está ajudando os pesquisadores a vincular as células do sistema imunológico a seus alvos. A ferramenta tem amplas aplicações na compreensão da função do sistema imunológico em infecções e doenças autoimunes, por exemplo.

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7. Com base na temática do Texto 1, traduza o excerto que segue. Observe que além da correspondência de sentido com o texto de partida, seu texto traduzido deve ter fluência, coesão e coerência. "The AI model we created is flexible and is applicable to every possible pathogen - as long as we have enough experimentally produced key-lock pairs. For example, we were quickly able to apply our model to coronavirus SARS-CoV-2 when a sufficient number of such pairs were available". \*

O modelo de IA que criamos é flexível e aplicável a todos os patógenos possíveis - desde que tenhamos pares de fechadura com chave, produzidos experimentalmente, em número suficiente. Por exemplo, fomos capazes de aplicar rapidamente nosso modelo ao coronavírus SARS-CoV-2 quando um número suficiente desses pares estava disponível.

8. Considerando os aspectos linguísticos do Texto 1, assinale a alternativa correta. \*

*Marcar apenas uma oval.*

- Em "The human immune defense is based on the ability of white blood cells to accurately identify disease-causing pathogens and to initiate a defense reaction against them." o pronome "them" refere-se a patógenos.
- A palavra "previously" em "The immune defense is able to recall the pathogens it has encountered previously, on which, for example, the effectiveness of vaccines is based." pode ser substituída por "posteriorly".
- O verbo "generated" em "Tools generated by AI are cost-effective research topics." está tempo verbal futuro.
- Em "With the help of these tools, we are able to make better use of the already published vast patient cohorts and gain additional understanding of them" o pronome "them" refere-se a ferramentas.

Texto 2

## Intellectual Property: The Real “Final Game” in Westworld

In television, intellectual property is periodically the subject of an episode or even a show (e.g., the patents in *Orphan Black*). Sometimes it is referred to off-handedly, but often incorrectly (e.g., “a ‘Tur-turkey-key’—copyright pending”). *Westworld* is a rare case where intellectual property is a subtle underlying theme and where, whether intentionally or not, each passing reference holds real meaning.

*Westworld*’s plot is driven by several puzzles, which both viewers and characters are trying to figure out. One of these is the question: What is the real “end goal” of the *Westworld* park? It is owned by a huge corporation (Delos) and seems like it could be a pretty lucrative business on its own. On the other hand, senior Delos employees regularly refer to the fact that the real value is not in the park itself.

When Season 2 begins, we have encountered only vague references to the fact that there is some unnamed “intellectual property” that is so valuable that the regular workings of this unprecedented park pale in comparison. My original guess was that there must be some “code” for an artificial intelligence that has been learning and evolving over the past 35 years. In the alternative, I thought they may be referring to a trove of data that they’ve been gathering about the guests, to be used for some sort of marketing purpose. But considering the use of “intellectual property” to describe the asset, it seems like either (a) the answer must be closer to an artificial intelligence than to raw data, or (b) we shouldn’t read too much into the terminology—everyone is just colloquially saying “IP.”

In real life in the U.S., we do not own our personal data; and those who invest in collecting our personal data under some cover of consent, do own that data in many ways. The implications of *Westworld*’s scenario compound this already questionable allocation of right. By compiling personal data in such a sophisticated way, Delos will soon own data-made replications of the person whose data they gathered. They have cleverly started to legitimize their project along the way by using “intellectual property” as the assumed legal framework for what they have acquired. Whereas their computer code and various processes would naturally be included in a set of intellectual property rights that are well defined, laws related to data are still in flux. It is not yet clear where they will settle within statutory and common law. This fantastical plot is important to watch because, even if this particular extreme scenario (immortality) never becomes a reality, it provides an example of what may happen when those who “own” our data are one step ahead of the legal system. If we aren’t prepared, an innovative form of asset may slip into a system of legal protections that cannot properly control it.

Fonte: Adaptado de:

<https://journals.library.columbia.edu/index.php/lawandarts/announcement/view/262>.

Acesso em: 23 abr. 2021.

9. Marque a alternativa que reflete as ideias do Texto 2. \*

1 ponto

*Marcar apenas uma oval.*

- Westworld é um caso raro onde a propriedade intelectual é um tema subjacente sutil e onde, intencionalmente ou não, cada referência passageira tem um significado real.
- Trata-se de como a transferência de tecnologia e sua utilização é feita em programas de televisão.
- O texto 2 aborda sobre como Robert Ford (Anthony Hopkins) criou os códigos utilizados em Westworld.
- Tudo isso é bom e assustador, e é uma versão muito mais sofisticada de um futuro baseado em dados do que programas semelhantes produziram

10. Qual é a sua resposta e a sua justificativa para o título do texto: "Intellectual Property: The Real "Final Game" in Westworld". Responda, em português. \*

1 ponto

**Propriedade Intelectual: O verdadeiro "jogo final" em Westworld**

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11. Um título novo para o Texto 2 poderia ser: \*

1 ponto

*Marcar apenas uma oval.*

- Intellectual property: approaches at TV serie Westworld
- Intellectual property is useless
- The intellectual property: step by step in the UK
- Intellectual property in the construction of games

12. Comente a relação entre propriedade intelectual e a vida real nos Estados Unidos, de acordo com sua compreensão do Texto 2. \* 1 ponto

Na vida real nos EUA, não somos proprietários de nossos dados pessoais; e aqueles que investem na coleta de nossos dados pessoais sob alguma forma de consentimento, possuem esses dados de várias maneiras. As implicações do cenário de Westworld agravam essa alocação já questionável de direitos. Considerando que seu código de computador e vários processos seriam naturalmente incluídos em um conjunto de direitos de propriedade intelectual que são bem definidos, as leis relacionadas a dados ainda estão em fluxo. Ainda não está claro onde eles se estabelecerão dentro da lei estatutária e comum.

13. Considerando os aspectos linguísticos do Texto 2, assinale a alternativa correta. \* 1 ponto

*Marcar apenas uma oval.*

- A palavra "Whereas" em "Whereas their computer code and various processes would naturally be included in a set of intellectual property rights that are well defined, laws related to data are still in flux" pode ser substituída por "considering"
- A palavra "thought" em "I thought they may be referring to a trove of data that they've been gathering about the guests, to be used for some sort of marketing purpose." significa toquei.
- A palavra "Whereas " em "Whereas their computer code and various processes would naturally be included in a set of intellectual property rights that are well defined" significa entretanto.
- n.d.a

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