



AI-Robotics vs COVID19

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About Discussions

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Discussions



Juan LLORET

30 March 2020 - updated 1 month ago

5 comments

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COVID-19 detector using X-ray images

In this detector (with a success of 97%) it is explained step by step how to build it based on deeplearning and neural networks.

- <https://medium.com/saturdays-ai/detector-de-covid-19-usando-im%C3%A1genes-de-rayos-x-aaa146efa26> (Spanish at the moment only available but you can use google translate, please).

The biggest drawback of the model is training, because it is based on medical images. These medical images for his model have initially come out of the University of Montreal (Joseph Paul Cohen [ieee8023](#)) (around 300 images).

- <https://github.com/ieee8023/covid-chestxray-dataset/tree/master/images>

But this number is insufficient to validate the model.

This other repository in Kaggle we have also taken into account:

- <https://www.kaggle.com/paultimothymooney/chest-xray-pneumonia>

Can any member of this group please tell us how we can acquire more images of patients with Cov19 and healthy patients?

Best regards, Juan Antonio.

Tags:

#AI #artificialintelligence #data #machinelearning #trainingcorporation #dataprotection #privacy #trustworthyai #intellectualproperty

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Juan LLORET,
01/04/2020 07:40

Additional literature II: digging, researching, more on the subject:

The EU has recently published its policy on *A European strategy for data* (<https://editorialia.com/2020/02/21/a-european-strategy-for-data/>) about which I published an article some time ago. This is a very, very serious and important matter for the future. I guess.

Why?

The data is susceptible to 'cooking', manipulation, can produce biases, polarize criticism and searches, etc. And this gives rise to reflect on 'training models' and 'black boxes'. And these are very little studied areas, such as:

- AI explainability and trustworthiness and 2.-Data security in relation to AI. Although IBM and ISACA have already put some rules, but under the business perspective, of course. For example:

- AI Explainability 360 Open Source Toolkit (IBM).
- COBIT 2019 Design Guide and Toolkit: Designing an Information & Technology Governance Solution.

We run serious risks of falling into the hands that end with foolish, false or unfounded theories. An article in LinkedIn, by Martin Hill, talks about this: <https://www.linkedin.com/pulse/one-thing-you-should-know-coronavirus-statistics-martin-hill/>

What do I mean then?

Well, the dataset, its origin, its reliability, its treatment is decisive in ensuring that we are useful to society and not a source of errors. And it must be regulated against such pandemics and anonymous and flexible enough to make it accessible to everyone. (Difficult task, but very necessary).

- And what does it, (what do we) need take to avoid being a source of errors?**

Reliability. Security at the origin of the data and above all, scientific rigor.

A recent Google article highlights the shortcomings and fears of programmers: *Toward Human-Centered Design for ML Frameworks* which means that our zeal and vigilance (in new areas of technology) must be very great, because programmers are not experts in these areas.. But at the same time allow everything to unfold.

Rigorousness and flexibility in capturing data should be a very important field of study regarding EU, in my opinion, please.

We keep working.

Total votes: 2

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Juan LLORET,
31/03/2020 00:33

Additional literature

COVID-Net is a convolutional neural network, a type of AI that is particularly good at recognizing images. Developed by Linda Wang and Alexander Wong at the University of Waterloo and IA firm DarwinAI in Canada, COVID-Net was trained to identify signs of Covid-19 on chest radiographs using 5,941 images taken from 2,839 patients with various lung conditions, including bacterial infections, non-Covid viral infections as well as Covid-19 infections. The dataset is provided along with the tool so that researchers, or anyone who wants to play, can explore and modify it.

External links:

- <https://arxiv.org/pdf/2003.09871.pdf>
- <https://www.technologyreview.es/s/12049/una-nueva-ia-podria-detectar-el-covid-19-en-una-radiografia-de-torax>

Best regards, Juan A.

Total votes: 0

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Rajiv Tayal,
30/03/2020 19:23

Juan, have you tried contacting JHU- John Hopkins University? They have been deeply engaged in this initiative and might offer source. All the best.

Total votes: 1

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Juan LLORET,
01/04/2020 06:38

Thank you, Rajiv. Very kind. And thanks for your time.

We have taken the first images from here: <https://github.com/ieee8023/covid-chestxray-dataset>.

But Uhhhf, I don't feel represented enough to address them **yet** (John Hopkins University). Maybe someone from the EU commission would support me (**us**)? I don't know... anyway I'm (**we**) going to try it anyway.

(From my last post, about initiatives, it is reasoned that **we have already access to 5941 images**). This is the article in **arXiv**, please: <https://arxiv.org/pdf/2003.09871.pdf>

I am also very concerned about final usefulness and prudence about all of this. This comment from Curtis Northcutt seems very, very reasonable to me. I am in contact with doctors and radiologists always asking if this, that, the other is really useful. I don't want to **be a victim of the investigative**

egocentrism.https://www.linkedin.com/posts/cgnorthcutt_please-stop-the-100-coronavirus-detection-activity-6650466481631035393-SNWJ

- So far I have gained access to Amazon's very likely most powerful global learning machine supported by AWS, look at the picture, please. https://drive.google.com/file/d/1QSPJckX74SiCvXEGwG8h0_ax/view?usp=sharing

You (every) can apply here: <https://www.datarobot.com/lp/covid-19-response-effort/>

I need help. That is sure.

Best regards, Juan A.

Total votes: 0

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Juan LLORET,
14/05/2020 11:46

Additional literature IV

- (This comment line is totally private, please, because it implies patient data. I request maximum discretion and that the data source that I present here is **not used**. I only do it to inform and out of a sense of duty. I do not authorize use under no circumstances to any member of this forum, please. I trust your full diligence, of course).

Conclusion in this area:

1.- Regarding the data, among others, I have managed to get data from;

- Turkey from my academic partners: http://covid19.burakgozutok.com/about_results.php

- Spain (HM Hospitals that apparently have released 2,157 HCEs of anonymous patients for the first time in the world):

https://www.linkedin.com/posts/juan-antonio-lloret-43a18972_comunicado-covid-activity-6656159674301317120-XMI1.

But I also have a conclusion that I want to share with you. Worrying.

I have noticed significant ignorance in software programmers in the area of medical imaging (general medicine), and as a consequence of this lack of knowledge bases, they only pursue the objective of programming in itself. I mean: they put above the function of THEIR OWN program (algorithm) versus in order to make it reliable and AUDITABLE to achieve the objective in medicine.

I've also observed that they use pre-packaged or pretraining (no strong pre-audit) models **similar to Resnet** (a CNN) that can lead to conflicts with law and rights. **It worries me, a lot.**

Currently (yesterday) I saw a course offered in Coursera by an accredited Stanford University professor who I am still auditing (attached the link to my LinkedIn

https://www.linkedin.com/posts/juan-antonio-lloret-43a18972_one-of-the-fastest-growing-ai-applications-activity-6656238981329625088-Okdc) and looking at the profile of the teachers (they are in a comment attached to the link) I do not trust much in that the result is will be very different. I say in search of the end OR OF THE OBJECTIVE.

Conclusion:

1.-We have, I think, to be quick to be able to offer the data (anonymised) to the researchers. Very important.

2.-A model, mainly in medicine, **should never be validated as long as its internal algorithm can be explained with complete transparency**. The opposite leads to black boxes and obfuscation.

3.-**There is a breakdown of specialties** (connection gap) that can be replaced (with biomedical engineers) by a new combined profile (doctor-engineer), but due to **my experience in my telemedicine** master's degree (medical image), neither I see very firm. **Which is the solution then?** I do not know yet, but I am very clear that we must continue working and investigating. A matter for the future to take into consideration.

I close this post referring to a medical image analyzer to detect COVID19 with the following motto:

"Machine learning, especially in medicine, is not yet reliable." And also doctors and radiologists are very reluctant to trust this, because it ignores the clinic of the patients. Something very important.

Corollary: I consider it important to add to the literature, of this research of mine, this article: '*On the Morality of Artificial Intelligence*' : <https://technologyandsociety.org/on-the-morality-of-artificial-intelligence/>

Annex 1 (14/05/2020).

- Please note this publication from the US FDA, which proposes a study on the subject of this article and asks researchers for feedback, *Artificial Intelligence and Machine Learning in Software as a Medical Device: discussion Paper and Request for Feedback* |

url: <https://editorialia.com/2020/05/07/fda/>

And

- The need for a system view to regulate artificial intelligence/machine learning-based software as medical device.* |

url: <https://editorialia.com/2020/04/20/the-need-for-a-system-view-to-regulate-artificial-intelligence-machine-learning-based-software-as-medical-device/>

Many thanks for your time. Closing this post.

Best regards, Juan Antonio.