



THE DEVELOPER'S CONFERENCE

**Como Machine Learning pode nos
ajudar a viver mais e melhor**

Karl Sousa

Engenheiro Eletrônico
Mestrando no CIn-UFPE

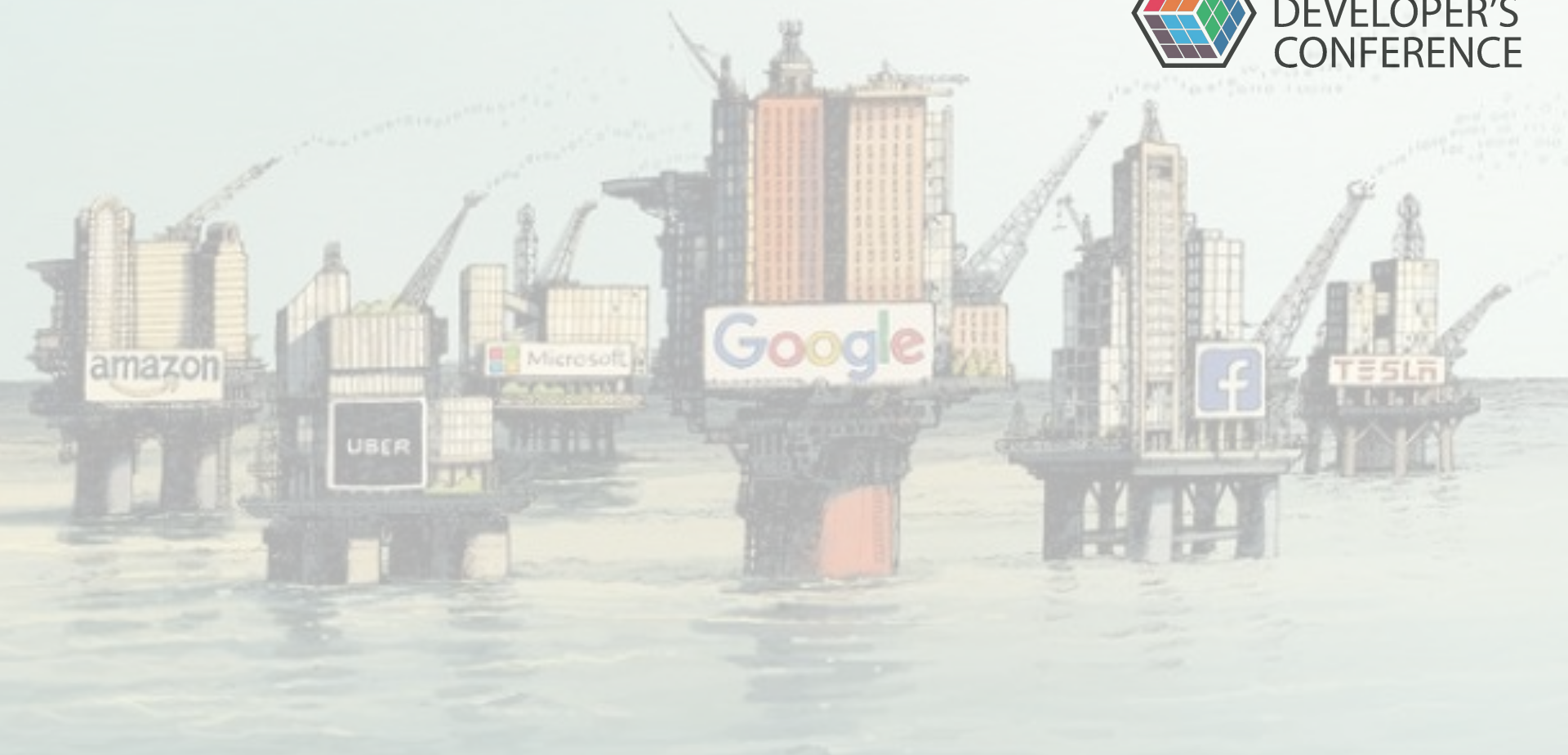
Agenda

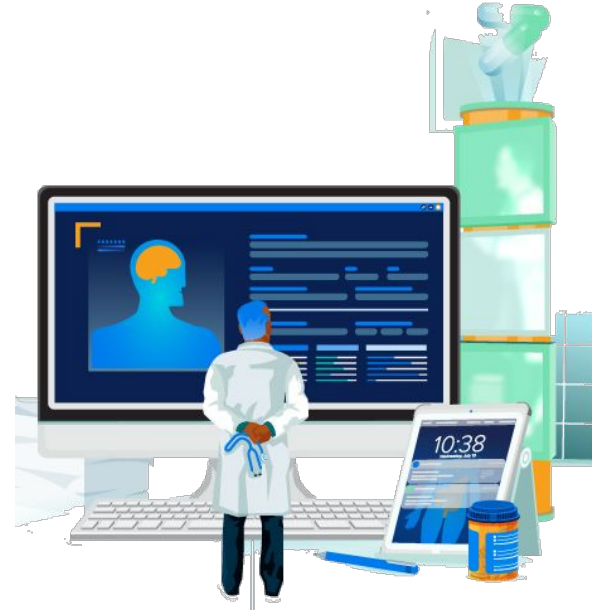


- Contextualização
- IA para uso clínico
- IA para sistemas de saúde
- IA para pacientes
- Desafios e limitações



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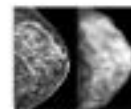
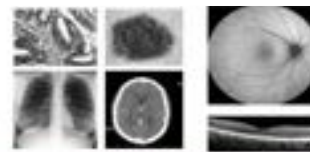
SUS



“O pior desperdício do SUS é o desperdício de informação.”

— Dráuzio Varella





Seleção
embrionária

Interpretação
de genoma

Voz de assistente
médico (ex.
Alexia)

K+

Saúde
mental

Atendimento
paramédico
(AVC, infarto)

Assistência no
diagnóstico
por imagem

Prevenção
de cegueira

Câncer:
identificar
mutações

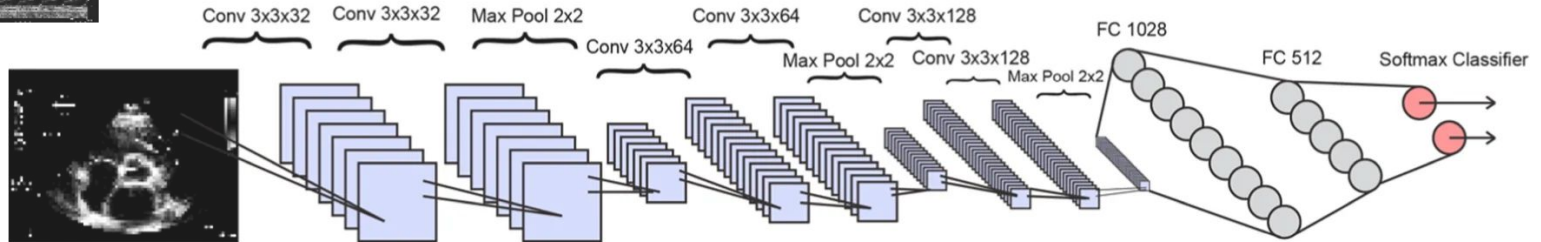
Promover
saúde do
paciente

Prever
morte no
hospital

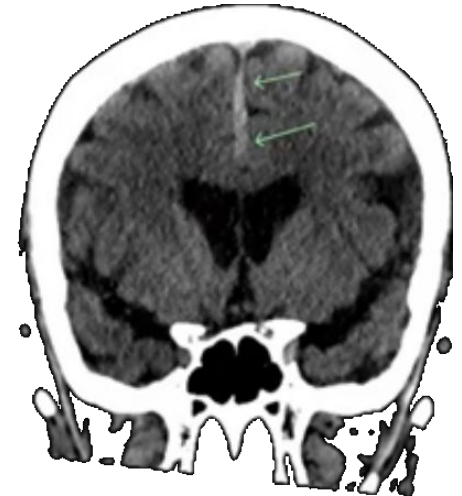
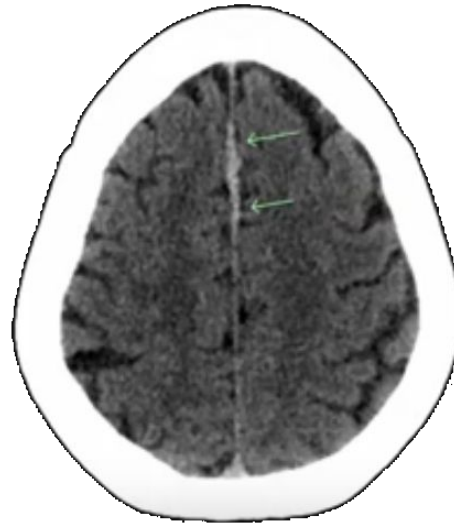
IA para uso clínico



3,6 bilhões
de imagens médicas/ano



IA para uso clínico



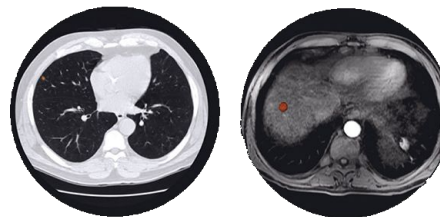
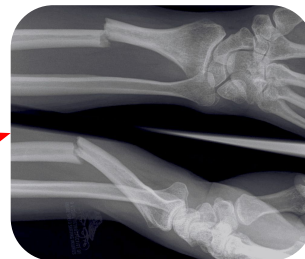
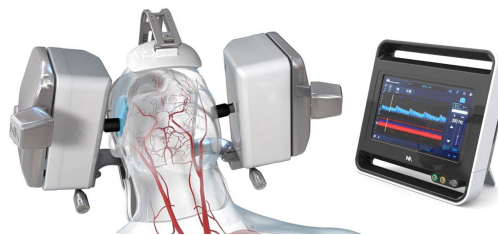
IA para uso clínico



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Table 2 | FDA AI approvals are accelerating

Company	FDA Approval	Indication
Apple	September 2018	Atrial fibrillation detection
Aidoc	August 2018	CT brain bleed diagnosis
iCAD	August 2018	Breast density via mammography
Zebra Medical	July 2018	Coronary calcium scoring
Bay Labs	June 2018	Echocardiogram EF determination
Neural Analytics	May 2018	Device for paramedic stroke diagnosis
IDx	April 2018	Diabetic retinopathy diagnosis
Icometrix	April 2018	MRI brain interpretation
Imagen	March 2018	X-ray wrist fracture diagnosis
Viz.ai	February 2018	CT stroke diagnosis
Arterys	February 2018	Liver and lung cancer (MRI, CT) diagnosis
MaxQ-AI	January 2018	CT brain bleed diagnosis
Alivecor	November 2017	Atrial fibrillation detection via Apple Watch
Arterys	January 2017	MRI heart interpretation



LUNG AI

LIVER AI

IA para sistemas de saúde



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IA para sistemas de saúde

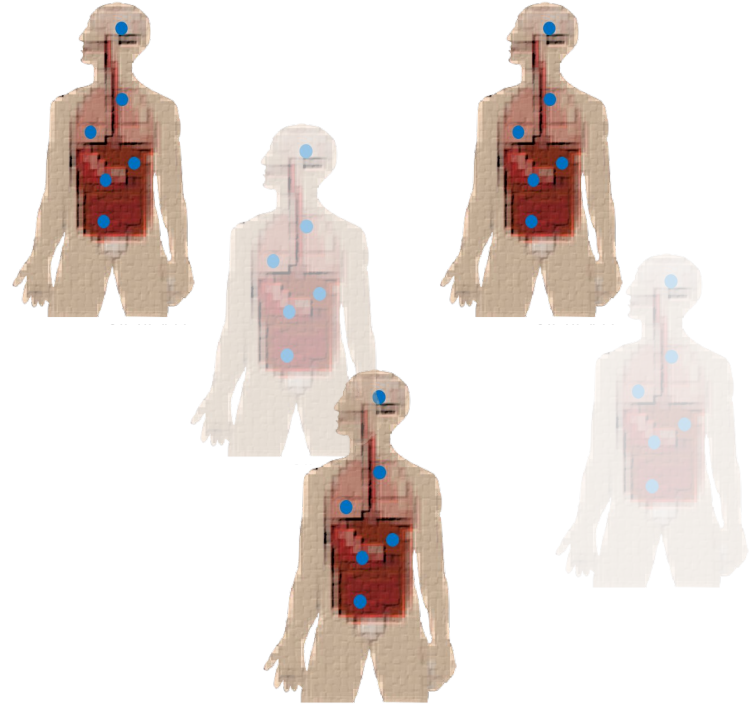


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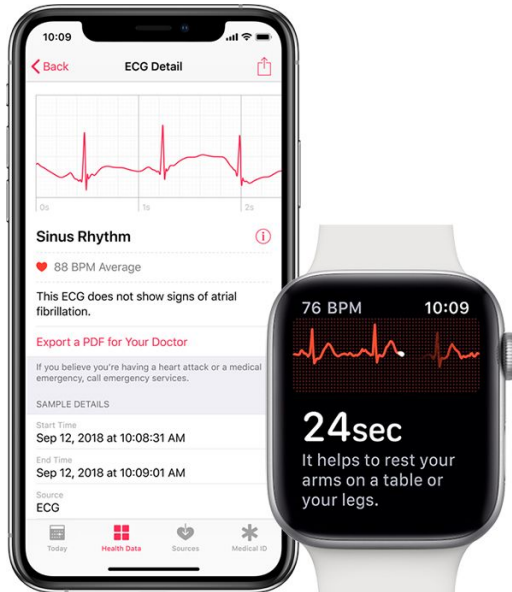




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IA para pacientes



Desafios e limitações

Do algoritmo de IA para a mudança da prática médica



Desafios e limitações



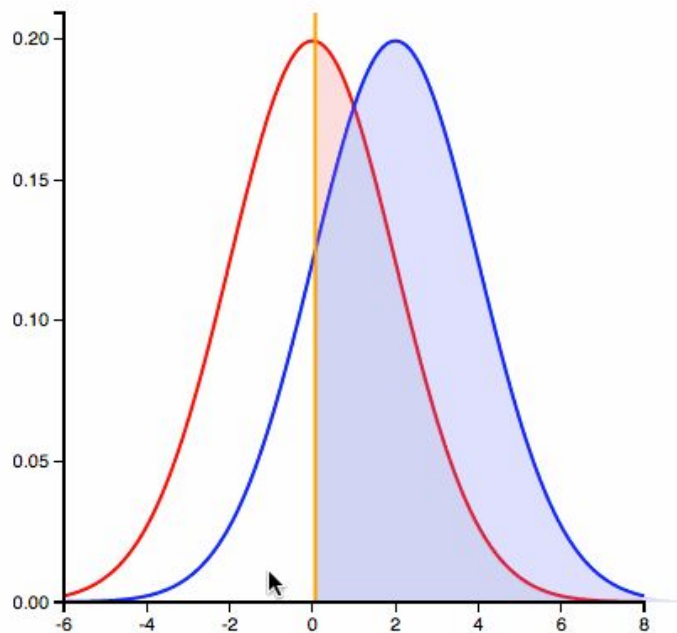
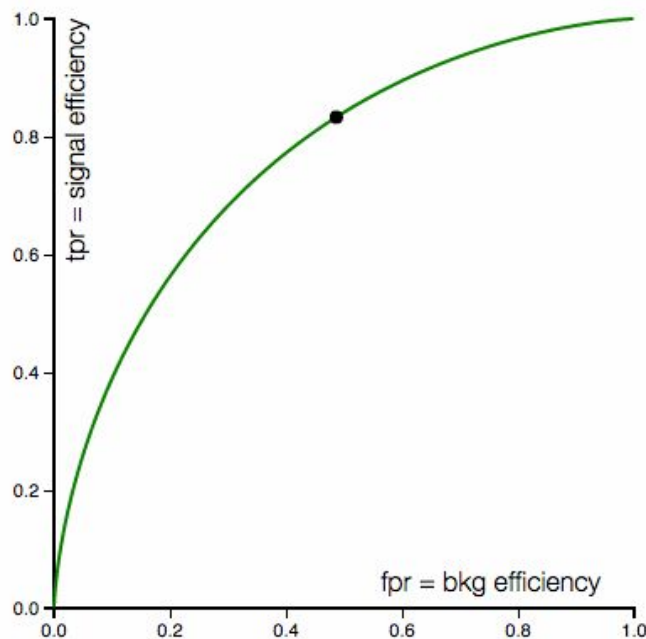
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mean #1:

mean #2:

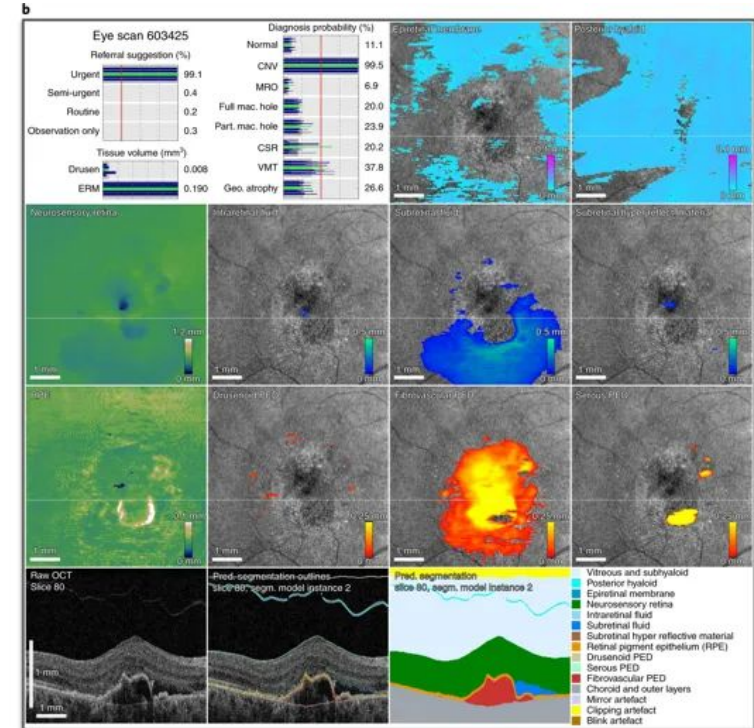
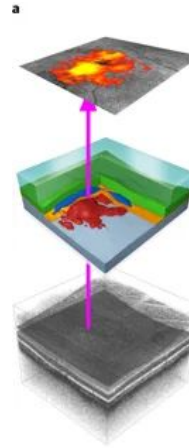
variance #1:

variance #2:

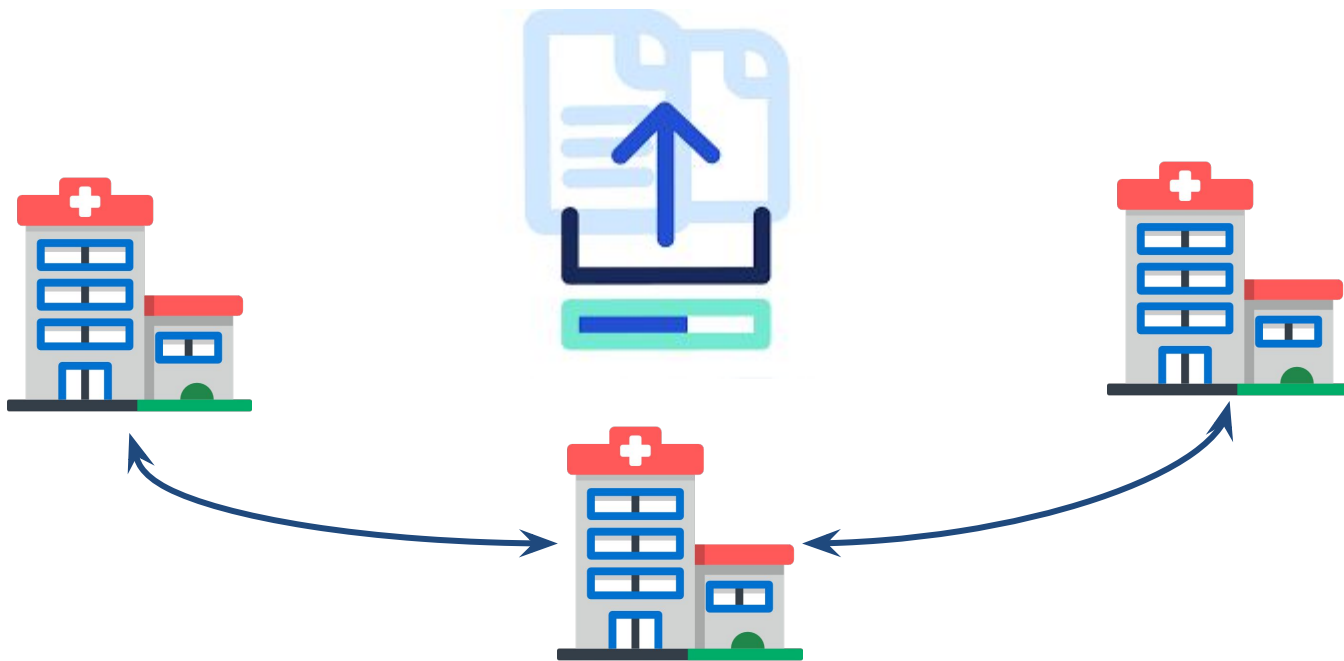


Desafios e limitações

- *Heat Maps*
- PFI
- Dependência parcial
- Valores SHAP



Desafios e limitações





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Karl Sousa



kvms@cin.ufpe.br



github.com/karlvandesman