

眼底情報からメンタルヘルスを評価する 最新AI技術の紹介

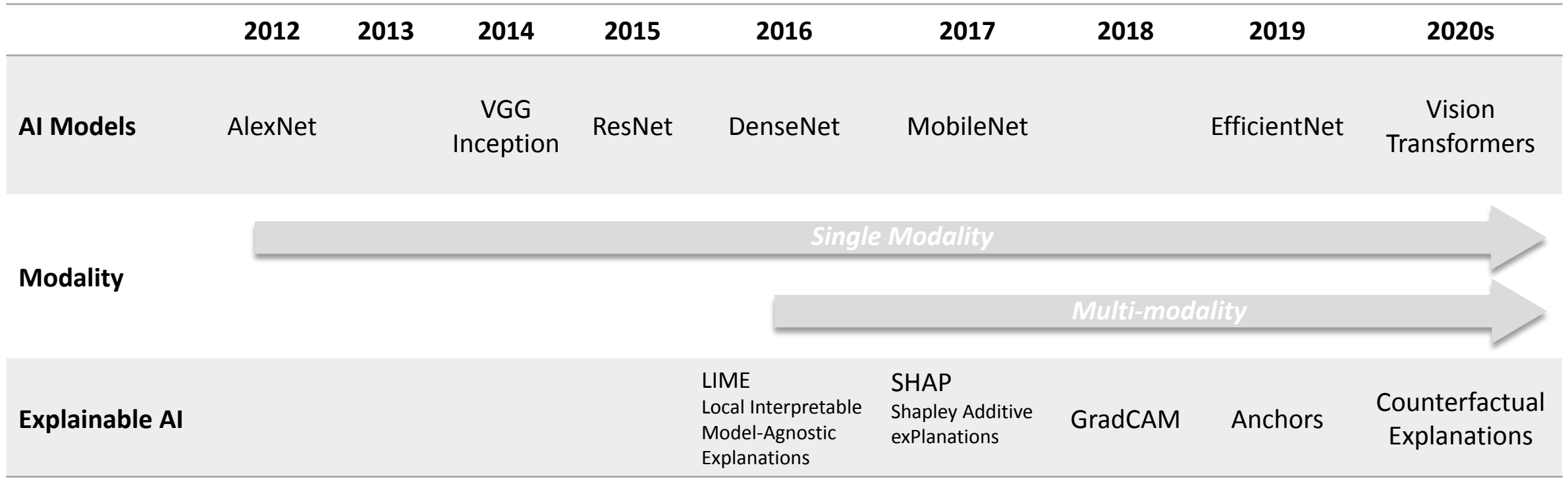
Assessing Mental Health from Fundus Information An Introduction to the Latest AI Technology

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4月7日の日本眼科学会で、次の内容で発表します

The following information will be presented at the Japanese Ophthalmological Society on April 7

- A brief history of AI for image analysis
- Systemic biomarkers assessment from the eye
- AI develop with data collected by Rohto
 - *HbA1c assessment*
 - *Depression assessment*
- Future AI developments
- Introduction of our AI development environment
- 画像解析のためのAIの歴史について
- 眼からの全身バイオマーカー評価
- ロート製薬が収集したデータでAIを開発
 - HbA1cの評価
 - うつ病の評価
- 今後のAIの展開
- 当社のAI開発環境のご紹介



The capability and efficiency of AI models are advancing at a rapid pace

AI models are now able to leverage and integrate multiple sources of information across modalities

The output of AI models is becoming increasingly interpretable and easier to comprehend

Depression Assessment

Input Biomarker	Conclusions	Reference
retinal vessel calibre (color fundus)	“ Depression and anxiety symptoms were associated with wider retinal venules ”	Meier MH, Gillespie NA, Hansell NK, et al. Associations between depression and anxiety symptoms and retinal vessel caliber in adolescents and young adults. <i>Psychosom Med</i> 2014 ; 76: 732–738.
GCL, IPL, and RNFL thickness (OCT)	“ Significantly reduced GCL, IPL and global and temporal superior RNFL thickness have been observed in recurrent MD patients compared with first episode patients, and in all MD patients compared with healthy controls”	Kalenderoglu A, Celik M, Sevgi-Karadag A, et al. Optic coherence tomography shows inflammation and degeneration in major depressive disorder patients correlated with disease severity. <i>J Affect Disord</i> 2016 ; 204: 159–165.
Retina thickness (OCT)	“The total retinal volume of the left eye has been shown to be greater than the right eye in MD patients , indicating a possible hemisphere-specific lateralization of cognitive processing.”	Schonfeldt-Lecuona C, Schmidt A, Kregel T, et al. Retinal changes in patients with major depressive disorder - A controlled optical coherence tomography study. <i>J Affect Disord</i> 2018 ; 227: 665–671.
retinal arteriolar tortuosity (color fundus)	“ Lower values of arteriolar tortuosity were significantly associated with depression ”	O’Neill, R. A., et al. "Association of reduced retinal arteriolar tortuosity with depression in older participants from the Northern Ireland cohort for the longitudinal study of ageing." <i>BMC geriatrics</i> 21.1 (2021): 1-8.
RNFL thickness (OCT)	“ Lower RNFL thickness was associated with higher incidence of clinically relevant depressive symptoms ”	van der Heide, Frank CT, et al. "Association of Retinal Nerve Fiber Layer Thickness, an Index of Neurodegeneration, With Depressive Symptoms Over Time." <i>JAMA network open</i> 4.11 (2021): e2134753-e2134753.
Choroid Thickness (OCT) Vessel density (OCTA) Visual field test	“MDD patients showed lower retinal vessel density (including radial peripapillary capillary vessel density, superficial and deep capillary plexus vessel density), thinner subfoveal choroidal thickness, and poorer visual fields compared to HCs (all $p < 0.05$).”	Liu, Xiao, et al. "Development of a Novel Retina– Based Diagnostic Score for Early Detection of Major Depressive Disorder: An Interdisciplinary View." <i>Frontiers in Psychiatry</i> 13 (2022).


Many existing studies show that depression is related to retinal vessels shape/size and retinal thickness.

Therefore, color fundus + OCT may be a good candidate for objective depression screening.

多くの既存研究で、うつ病は網膜血管の形状/サイズや網膜の厚さと関係があることが示されています。そのため、カラー眼底+OCTは客観的なうつ病スクリーニングの有力な候補となる可能性があります。

- We hope that "the eye is the window to the mind and body" will develop further.
- We hope that our AI development environment will be of service to you.
- 「眼は心身の窓」がさらに発展することを望みます。
- 当社のAI開発環境が皆様のお役に立てればと思います。

We will update the content after April 7, so please visit our website again!
4月7日以降に内容を更新しますので、またホームページにアクセスお願いします

 <https://sensor-ai.co.jp/>