Supplementary Online Content

Wang M, Tichelaar J, Pasquale LR, et al. Characterization of central visual field loss in end-stage glaucoma by unsupervised artificial intelligence. *JAMA Ophthalmol.* Published online January 2, 2020. doi:10.1001/jamaophthalmol.2019.5413

eMethods. Identification of Representative Patterns of 24-2 VF in End-Stage Glaucoma

eFigure 1. The 18 Representative Archetype Patterns of 24-2 VFs and an Example of the VF Decomposition

eFigure 2. The Archetype VF Patterns Obtained From 197 Combined 24-2 and 10-2 VFs Tested on the Same Dates
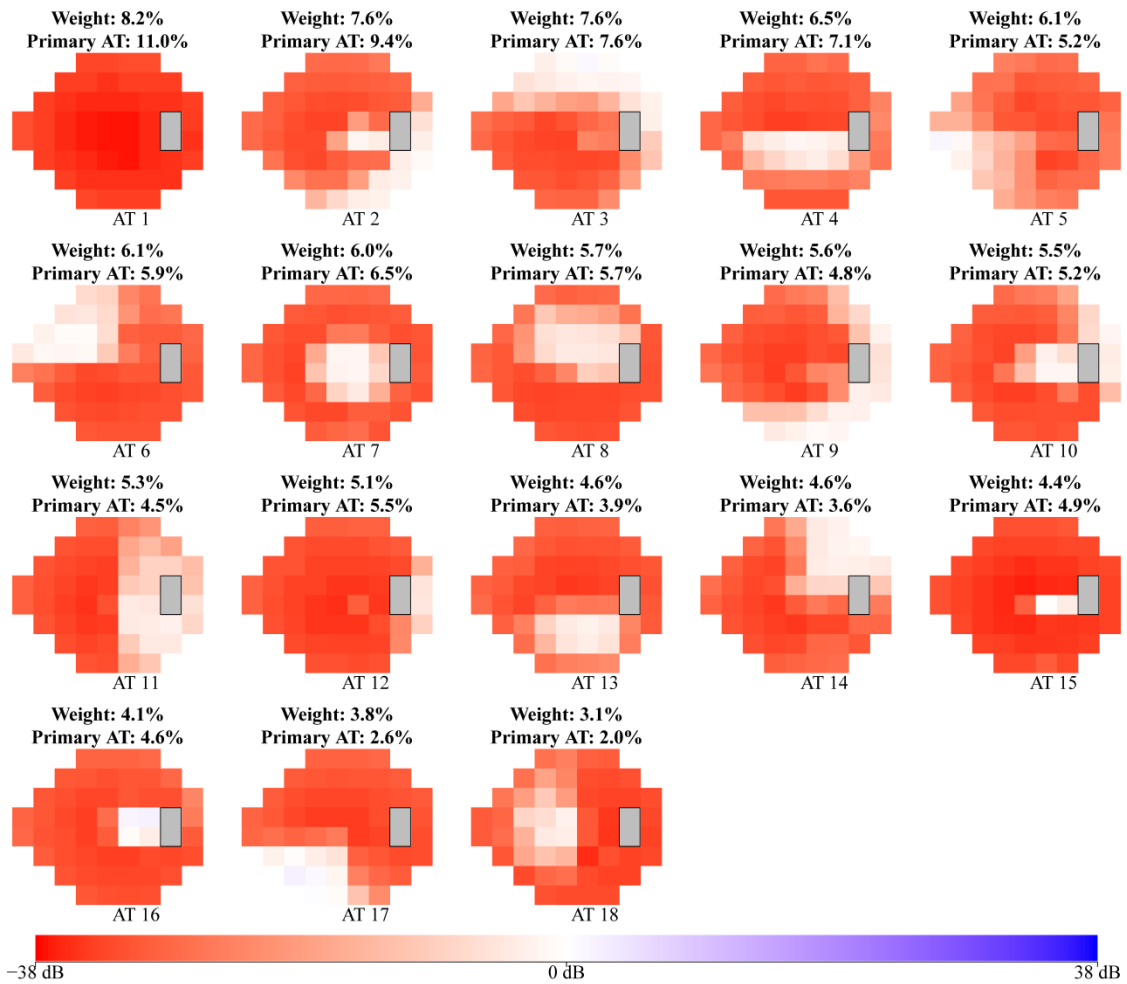
This supplementary material has been provided by the authors to give readers additional information about their work.

17   **eMethods.** Identification of Representative Patterns of 24-2 VF in End-Stage Glaucoma

18   The most recent reliable 7,680 VFs (average MD: -25.5±2.6 dB) from 7,680 eyes were used to identify

19   the representative patterns of 24-2 VF in end-stage glaucoma. eFigure 1 (a) shows the 18 representative

20   archetype patterns of 24-2 VFs in end-stage glaucoma (MD ≤ -22 dB). The 18 archetypes include diffuse

21   loss (archetype 1), temporal island (archetypes 9 and 12), various central island patterns (archetypes 2, 7,

22   8, 10, 15 and 16), inferior island patterns (archetypes 4 and 13), superior sparing (archetype 3), quadrant

23   sparing (archetypes 5, 6, 14 and 17), and nasal (archetype 11) or temporal hemianopia patterns (archetype

24   18). The 18 archetypes are ordered by their respective decomposition weights, which reflect the

25   contribution of each archetype over the entire set of visual fields, and can be interpreted as the relative

26   importance of this archetype in the dataset (eFigure 1 (a)). The most prevalent archetype was archetype 1,

27   which represents diffuse VF loss. Our model allows any arbitrary 24-2 VF with MD ≤ -22 dB to be

28   decomposed as a linear combination of those 18 archetypes, as illustrated in eFigure 1 (b). For each VF,

29   the archetype with the largest decomposition coefficient is assigned as the primary archetype for that VF.

30   eFigure 2 shows (a) the combined 24-2 and 10-2 VF patterns, (b) 24-2 patterns in isolation, and (c) 10-2

31   patterns in isolation from 197 most recent pairs of 24-2 and 10-2 VFs tested on the same dates from 197

32   eyes. It can be observed that the central VF captured by 24-2 VFs strongly corresponds to the detailed 10-

33   2 VF measurements.

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eFigure 1. The 18 Representative Archetype Patterns of 24-2 VFs and an Example of the VF

36   Decomposition

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38

39   (a)

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TD Probabilities   TD Measurement

Computational Decomposition

52.6% AT 2   **40.0% AT 7**   **6.4% AT 9**

-38 dB   0 dB   -38 dB

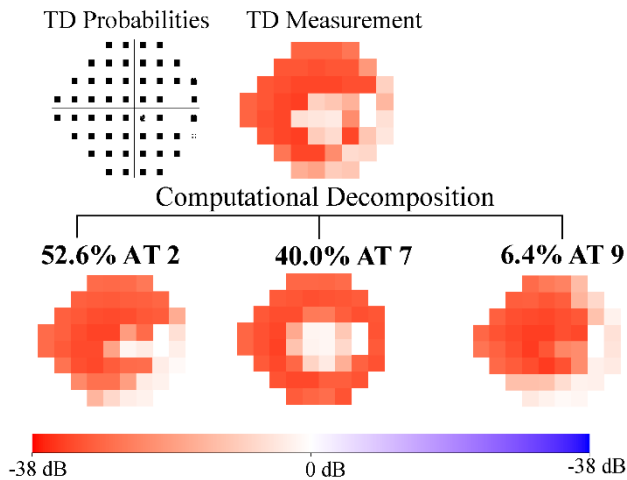41

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43   (b)

44   (a), The 18 representative archetype patterns of 24-2 VFs identified from the 7,680 most recent VFs of

45   7,680 eyes and (b), an example of the VF decomposition to the VF archetypes. The 18 archetypes are

46   ordered by their respective decomposition weights averaging over all VFs. Any VF with MD ≤ -22 dB

47   can be decomposed as a linear combination of those 18 archetypes. For each VF, the archetype with the

48   largest decomposition coefficient is assigned as the primary archetype for that VF. The percentage of each

49   archetype as primary archetype over all VFs is also reported. VF = visual field; MD = mean deviation;

50   AT = archetype.

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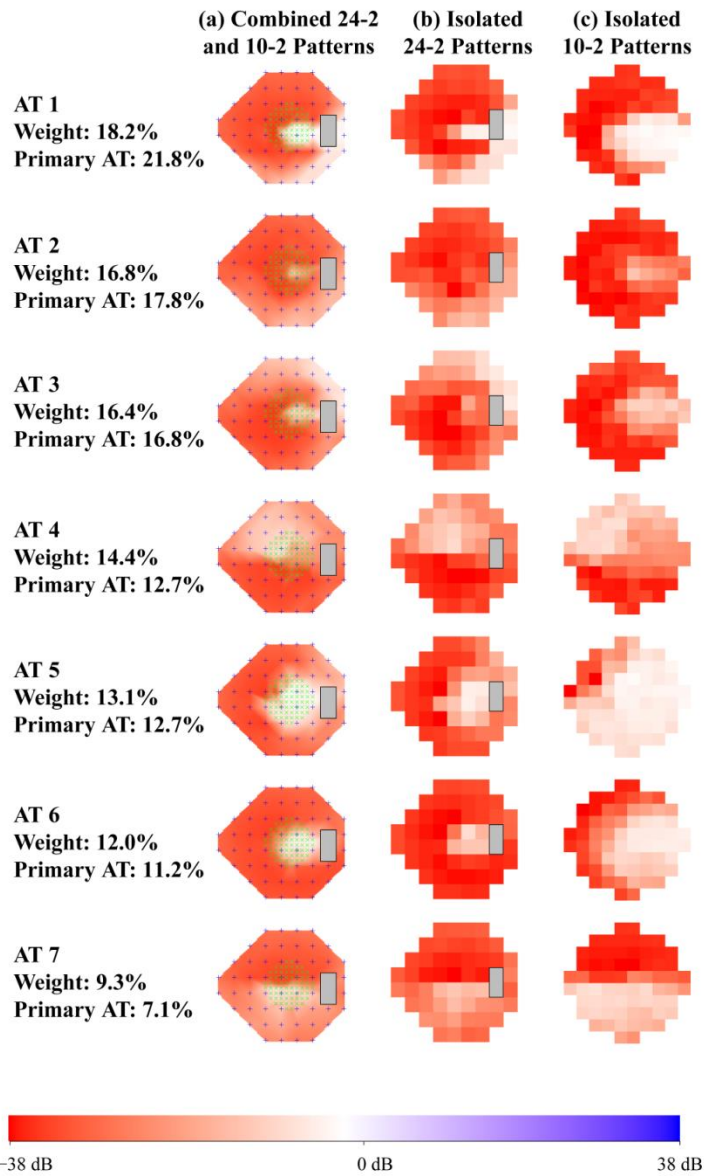
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56   (a) The combined 24-2 and 10-2 VF patterns with blue plus sign denoting 24-2 testing locations and

57   green cross sign denoting 10-2 testing, (b) the isolated 24-2 VF patterns and (c) the isolated 10-2 VF

58   patterns. Note that, the continuous total deviation values for the combined patterns in (a) were determined

59   by linear interpolation of the total deviation values between the measurement locations. All VFs are

60   plotted in right eye format. AT = archetype; VF = visual field.

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