

DYNAMIC VISUAL ACUITY

DEVELOPMENT OF A NEW DISPLAY BASED TESTING METHOD

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PURPOSE

THE DYNAMIC VISUAL ACUITY (DVA) DEFINES THE ABILITY TO DETECT FINE DETAILS IN MOVING OBJECTS. AVAILABLE DIGITAL TESTING DEVICES SUFFER FROM:

• A POOR DISPLAY PERFORMANCE

• MOTION BLUR

• AFTERIMAGES

CONSIDERING THE TECHNOLOGICAL PROGRESS OF VISUAL DISPLAY UNITS A NEW, STANDARDIZED TESTING METHOD FOR THE MEASUREMENT OF THE DVA SHOULD BE ACHIEVED.

METHOD

MARKET ANALYSIS

SELF EXPERIMENTS

FEASABILITY ANALYSIS

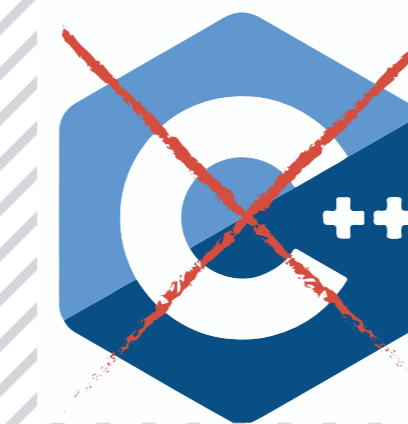
RESULTS

CODE



SUITABLE & EASY TO USE; BUT VERY ELABORATE

Flash



REQUIRES EXCELLENT CODING SKILLS

DVA TEST PROPERTIES

DISPLAY TECHNOLOGY



TOO SLOW (60HZ) OR POOR DPI OR TOO EXPENSIVE



VERY FAST 240HZ EIZO DISPLAY (BLINKING BACKLIGHT), GOOD REACTION TIME; AKZEPTABLE DPI



TOO SLOW AND POOR REACTION TIME; TOO SMALL OR TOO EXPENSIVE



POOR DPI; POOR REACTION TIME; INHOMOGENEOUS BACKLIGHT

PRESENTATION

OPTOTYPE



STANDARDIZED; MORE VALID VA; LOWER CHANCE OF GUESSING, BUT ROUND: BAD FOR DIGITAL PRESENTATION

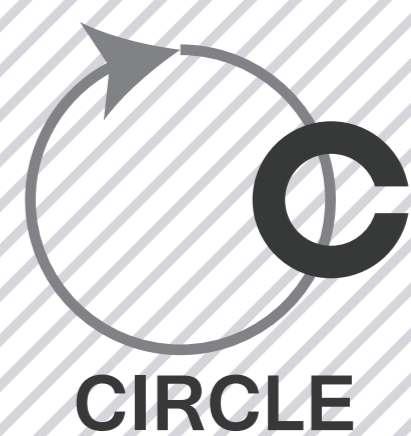


RECTANGULAR. GOOD FOR DIGITAL PRESENTATION; LESS RELIABLE (DUE TO BIG CONTRAST DIFFERENCES)

PATH

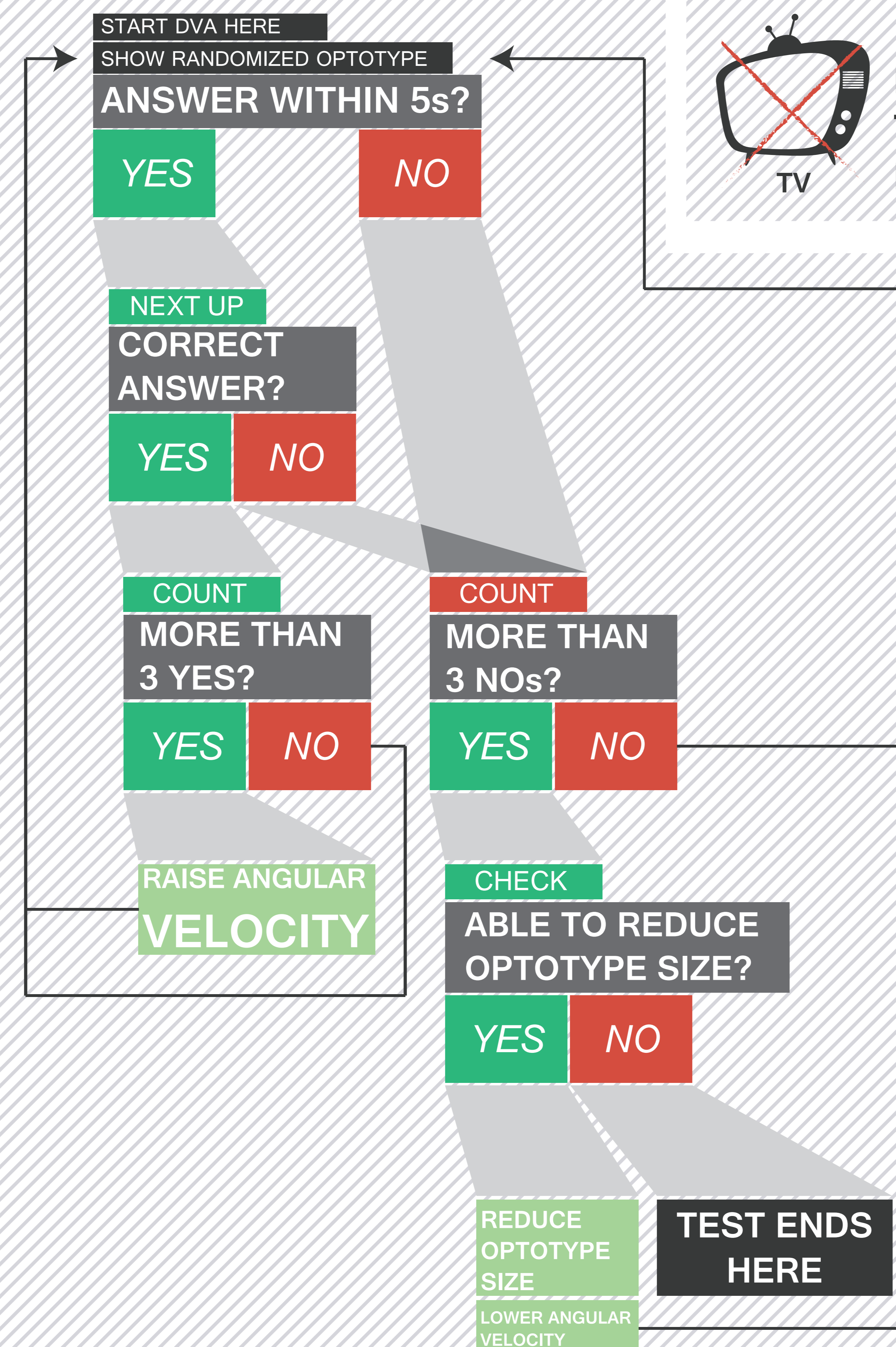


TOO SHORT DISPLAY DURATION FOR HIGHER ANGULAR VELOCITIES; VARIABLE DURATION TIME



NO END POINT - DURATION TIME CAN BE DEFINED TO A FIXED VALUE (2s)

TESTING METHOD



CONCLUSION

DUE TO MODERN DISPLAY TECHNOLOGY IT IS POSSIBLE TO MEASURE THE DVA DEPENDING ON THE ANGULAR VELOCITY AND THE SIZE OF THE OPTOTYPE. THEREFORE A NEW STANDARDIZED TESTING METHOD HAS BEEN DEVELOPED. THE TECHNICAL PROGRESS NEEDS TO BE OBSERVED, ABOVE ALL: HDMI 2.0 AS WELL AS 4K-RESOLUTION. THE TEST SHOULD BE RECODED IN C++ TO MINIMIZE THE RANDOMIZATION AND PRESENTATION EFFORT AND TO LOWER THE REQUIRED COMPUTER PERFORMANCE. FURTHER STUDIES SHOULD DETERMINE AND VALIDATE DEFINED VELOCITIES AND SIZES OF THE MOVING OPTOTYPES.

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