P1858

Type of Project: Revision to IEEE Standard 1858-2023
Project Request Type: Initiation / Revision
PAR Request Date: 12 Mar 2025
PAR Approval Date: 10 Sep 2025
PAR Expiration Date: 31 Dec 2029
PAR Status: Active
Root Project: 1858-2023

1.1 Project Number: P1858
1.2 Type of Document: Standard
1.3 Life Cycle: Full Use

2.1 Project Title: Standard for Camera Perceptual Image Quality (CPIQ)
Change to Title: ~~IEEE~~ Standard for Camera~~Phone~~ Perceptual Image Quality (CPIQ)

3.1 Working Group: Camera Phone Image Quality(CTS/ETSC/CPIQ)
3.1.1 Contact Information for Working Group Chair:
Name: Henry Koren
Email Address: henry@imatest.com
3.1.2 Contact Information for Working Group Vice Chair:
None
3.2 Society and Committee: IEEE Consumer Technology Society/Emerging Technology Standards Committee(CTS/ETSC)
3.2.1 Contact Information for Standards Committee Chair:
Name: Kim Fung Tsang
Email Address: ee330015@cityu.edu.hk
3.2.2 Contact Information for Standards Committee Vice Chair:
Name: Thomas Coughlin
Email Address: tomcoughlin@ieee.org
3.2.3 Contact Information for Standards Representative:
None

4.1 Type of Ballot: Individual
4.2 Expected Date of submission of draft to the IEEE SA for Initial Standards Committee Ballot: Jun 2026
4.3 Projected Completion Date for Submittal to RevCom: Jun 2027

5.1 Approximate number of people expected to be actively involved in the development of this project: 8
5.2 Scope of proposed standard: This standard addresses the fundamental attributes that contribute to video and still image quality for human observers. The standard defines a suite of objective and subjective test methods for measuring perceptual image quality attributes, and it specifies tools and test methods to facilitate standards-based communication and comparison among imaging industry companies regarding camera image quality.
Change to scope of proposed standard: This standard addresses the fundamental attributes that contribute to video and still image quality~~, as well as identifying existing metrics and other~~ for ~~useful information~~ human ~~relating~~ observers. ~~to~~ The ~~these attributes. It~~ standard defines a ~~standardized~~ suite of objective and subjective test methods for measuring ~~camera phone~~ perceptual image quality attributes, and it specifies tools and test methods to facilitate standards-based communication and comparison among ~~carriers,~~ imaging ~~handset~~ industry ~~manufacturers, and component vendors~~ companies regarding camera ~~phone~~ image quality.

5.3 Is the completion of this standard contingent upon the completion of another standard? No
5.4 Purpose: Camera-equipped mobile devices have become ubiquitous, displacing dedicated digital cameras as many users' primary tools for photography. Standard means of measuring the quality of these camera systems do not always correlate well with the perception of human observers and do not typically consider the degree of signal processing which could potentially be excessive, leading to an image that appears unrealistic. This standard establishes a uniform means of evaluating the quality of cameras for pictorial imaging, allowing objective comparison between devices, models, and manufacturers, using a variety of metrics that are relevant to consumer photography.

Change to Purpose: Camera-equipped mobile devices have become ubiquitous, displacing dedicated digital cameras as many users ~~'~~ ' primary tools for photography. ~~However,~~ Standard ~~consumers~~ means ~~have little guidance~~ of ~~about~~ measuring the quality of ~~the~~ these ~~images~~ camera ~~produced by~~ systems ~~particular~~ do ~~device~~ not ~~models.~~ always ~~That~~ correlate ~~lack~~ well ~~of~~ with ~~guidance~~ the ~~is~~ perception ~~due~~ of ~~in~~ human ~~part~~ observers ~~to~~ and ~~a~~ do ~~lack~~ not ~~of~~ typically ~~uniform~~ consider ~~image~~ the ~~quality~~ degree ~~testing~~ of ~~for~~ signal ~~the~~ processing ~~devices,~~ which ~~and~~ could ~~what~~ potentially ~~testing~~ be ~~is~~ excessive, ~~done~~ leading ~~seldom~~ to ~~is~~ an ~~accessible~~ image ~~to~~ that ~~the~~ appears ~~layperson~~ unrealistic . This standard ~~attempts to establish~~ establishes a uniform means of evaluating the quality of cameras ~~in~~ for ~~mobile~~ pictorial ~~devices~~ imaging , allowing objective comparison between devices, models, and manufacturers, using a variety of metrics that are relevant to consumer photography.

5.5 Need for the Project: Cameras currently on the market with identical image (megapixel) resolution capabilities produce vastly different quality images. Due to sensor and lens size limitations, increasing the number of megapixels in a camera may not necessarily improve image quality. Camera vendors do not have sufficient standardized metrics to compare one product to the next. At the same time, they know that image quality is important to consumers as an aspect of product quality, and important to motivate them to print or share those images and videos.

Change to Need for the Project: ~~Camera phones~~ Cameras currently on the market with identical image (megapixel) resolution capabilities produce vastly different quality images. Due to sensor and lens size limitations, increasing the number of megapixels in a camera ~~phone often~~ may ~~leads~~ not ~~to~~ necessarily ~~reduced~~ improve image quality. Camera ~~phone~~ vendors do not have sufficient standardized metrics to compare one product to the next. ~~They simply know whether or not a mobile phone contains an image capture device.~~ At the same time, they know that image quality is important to consumers as an aspect of product quality, and important to motivate them to print or share those images and videos .

5.6 Stakeholders for the Standard: Manufacturers of camera-equipped devices, application developers, telecom service providers, OS vendors, test labs and test software and equipment vendors, sensor, lens, and ISP manufacturers.

Change to Stakeholders for the Standard: ~~Camera-equipped~~ Manufacturers ~~mobile~~ of ~~device~~ camera-equipped ~~manufacturers~~ devices , application developers, telecom service providers, OS vendors, test labs and test software and equipment vendors, sensor, lens, and ISP manufacturers.

6.1 Intellectual Property

6.1.1 Is the Standards Committee aware of any copyright permissions needed for this project?
No

6.1.2 Is the Standards Committee aware of possible registration activity related to this project?
No

7.1 Are there other standards or projects with a similar scope? Yes

Change to Are there other standards or projects with a similar scope? ~~No~~ Yes

Explanation: ISO TC/42 WG/18's ISO 12233 standard addresses perceptual sharpness with its own acutance metric that was inspired by IEEE 1858-2016, their ISO 15739 standard addresses visual noise with an approach that is somewhat different than the IEEE 1858 approach, using flat patches with added noise rather than noise added to natural scenes for the psychophysical study of visual noise. That is where the similarity stops; there are no other standards that address distortion, color uniformity, lateral color, chroma level, sharpening level, or HDR processing, making IEEE 1858 a unique collection of perceptual image quality metrics.

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7.2 Is it the intent to develop this document jointly with another organization? No

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8.1 Additional Explanatory Notes: This revision will include metrics for gauging the noticeability of signal processing applied to images and video, going beyond quality loss to gauge human preference. When an image has excessive sharpening or HDR processing, the image can become unrealistic or uncanny. We will be also extending the still image noise metrics into video noise characterization. This standard seeks to facilitate the development and tuning of higher-quality cameras and image-processing pipelines.