

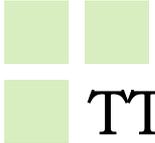
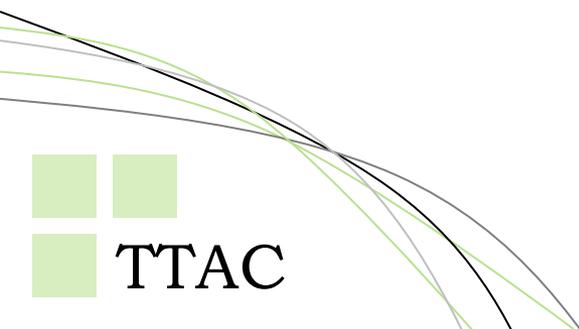
Telehealth Technology Assessment Center

Digital Camera Selection for 2010

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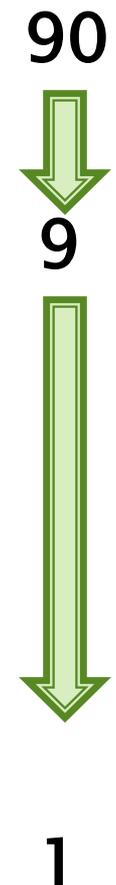


TTAC

Methods

- ▶ **Market Identification of All Cameras**
- ▶ **Market Review Selection**
- ▶ **Hands–On Evaluation**
 - Mechanical Review
 - Image Quality Review
- ▶ **Feature Analysis**
- ▶ **Final Selection**

Methods

- ▶ **Market Identification of All Cameras** 90
 - ▶ **Market Review Selection** 9
 - ▶ **Hands-On Evaluation**
 - ▶ **Feature Analysis**
 - ▶ **Final Selection** 1
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Market Identification and Market Review – – Sources – –

- ▶ Internet sites of manufacturers, distributors, and camera review websites
- ▶ Available literature, magazines, specification lists, camera instruction manuals
- ▶ Visits to local retailers

MARKET REVIEW

What's out there?

▶ We like:

- Manufacturer web sites
- www.imaging-resource.com
- www.neocamera.com
- www.dpreview.com
- www.myproductadvisor.com/mpa/home.do

▶ Read

- Internet
- Emails

▶ Talk

- Local camera store
- Other users

▶ Try

- Box stores
- Friends, colleagues

Market Identification

- ▶ All point-and-shoot cameras under \$400 that have macro capability and are newly available after January 2010 (thru July 2010)
- ▶ Includes Canon, Casio, Fujifilm, Kodak, Nikon, Olympus, Panasonic, Pentax, Samsung, and Sony
- ▶ Not: SLR-like cameras nor water cameras

Market Review – Selection Criteria

► Identified 90 Digital Cameras on the Market

Canon	Casio	Fuji	Kodak	Nikon	Olympus	Panasonic	Pentax	Samsung	Sony
A490	EX-Z2000	JV100	M575	L110	9010	DMC-ZR3	H90	HZ30W	DSC-HX5V
A495	EX-Z550	F80EXR	M550	L22	7040	DMC-FX66	I-10	HZ35W	DSC-W330
A3000 IS	EX-H15	Z700EXR	M530	L21	7030	DMC-FT2	M90	TL240	DSC-W320
A3100 IS	EX-FH100	Z70	SLICE	S8000	5010	DMC-ZS7		TL210	DSC-W310
SD1400	EX-S7	S1800	M580	S6000	FE-4040	DMC-ZS5		TL205	DSC-W380
SD1300	EX-Z35	S1600	M590	S4000	FE-4030	DMC-TS10		SL600	DSC-TX7
SX210	EX-H5	JZ500		S3000	FE-47	DMC-FH1		SL605	DSC-W370
SD3500	EX-Z800	JZ300		P100		DMC-FH3		CL80	DSC-W350
SD4000IS		JV150				DMC-FP3		ST80	DSC-S2100
		Z800EXR				DMC-FP2		TL500	DSC-S2000
						DMC-FP1		TL350	DSC-TX5
						DMC-FH22		HZ50W	DSC-H55
						DMC-FH20			DSC-TX9
						DMC-FX75			

Market Review

- ▶ Need to narrow the field to one camera per manufacturer
- ▶ Need requirements and criteria for camera selection
- ▶ Allow us to move from Market Review to Hands-On Review

Basic Requirements

- ▶ Users: Basic to advanced, point-and-shoot, low to high volume use
- ▶ Clinical applications: Multiple, i.e., Skin, face, wounds
- ▶ Auto mode: Mostly utilized
- ▶ Macro: Frequent use
- ▶ Image Quality of High Importance
- ▶ Ease-of-Use of High Importance

Further Selection Criteria

Positive Attributes

- ▶ Overall ergonomics, intuitive buttons, auto mode accessibility & reliability, macro capability closer than 10 cm, auto macro, standard image storage, bright LCD, high definition video, and overall good reviews

Negative Attributes

- ▶ Less-durable materials, cheap-looking entry-level cameras, small size (hard to grip), and very small buttons, poor finger positioning

Market Review – Selection Process

We researched the cameras and examined some in-person, at stores. We spoke with others. The Basic Requirements and Selection Criteria guided our decision making process. We selected one top camera from each of the ten manufacturers.

Limitation

There could be another good camera that did not make it to the “hands-on” review

Market Review Selection – 2010 Cameras –



- ▶ Canon PowerShot SD3500 IS
- ▶ Casio EXILIM EX-FH100
- ▶ Fujifilm FinePix F80EXR
- ▶ Kodak EasyShare M580
- ▶ Nikon Coolpix S8000
- ▶ Olympus Stylus-7040
- ▶ Panasonic Lumix DMC-ZS5
- ▶ Pentax Optio H90
- ▶ Samsung HZ35W

...On to the Hands-On Review!

Hands-On Evaluation

- ▶ Mechanical Review (Ease-of-Use, etc.)
- ▶ Image Quality Review
- ▶ Feature Analysis and Final Camera Selection



Mechanical Review

- ▶ **Can the end-user understand the controls sufficient to take good pictures?**
 - e.g. What are the training requirements?
 - e.g. Can it easily take high quality macro images?
- ▶ **Things to consider:**
 - Macro Mode
 - Flash
 - Size
 - Batteries and Power Charging
 - Image Transfer

Mechanical Review

► Mechanics

- Overall feel
- Accessibility of ports
- Accessibility of battery
- Accessibility of memory card
- Overall appearance
- Material
- Durability
- Button layout
- Appropriate size



*Score 1 thru 5, where
1=Poor (Worst), 2 =Fair,
3 = Good, 4 = Very Good,
5 = Excellent (Best)*

Mechanical Review

▶ Ease-of-Use

- On/Off
- Auto Mode
- Scene Mode
- Video Mode
- Macro
- Flash
- Settings Menus
- Image Review
- Image Delete
- Take a photo – auto
- Take a photo – macro



*Score 1 thru 5, where
1=Poor (Worst), 2 =Fair,
3 = Good, 4 = Very Good,
5 = Excellent (Best)*

Mechanical Review

▶ Macro

- How close you can get?
- Ease of macro on/off?
- Super macro required?
- Does auto provide macro?

▶ Image Transfer

- Memory Card
- Ease of USB Transfer
- USB Cord – Sturdy
- Standard USB Cord (Non-propr.)

▶ Power

- Battery type
- Battery Number
- Battery charger type
- Charge in-camera c USB?
- Charge in-camera c AC power?
- Advertised # photos per charge

*Informational;
No Likert Score*

Mechanical Review

- ▶ Four cameras scored highest : Fuji F80 EXR, Samsung HZ35W, Panasonic DMC-ZS5 and Nikon S8000.
- ▶ Reviewers general impressions that these are four intuitive cameras that are comfortable, offer good functionality and seem reliable.
- ▶ The other five cameras scored lower for various reasons and are not recommended for the average clinical user.

Other considerations

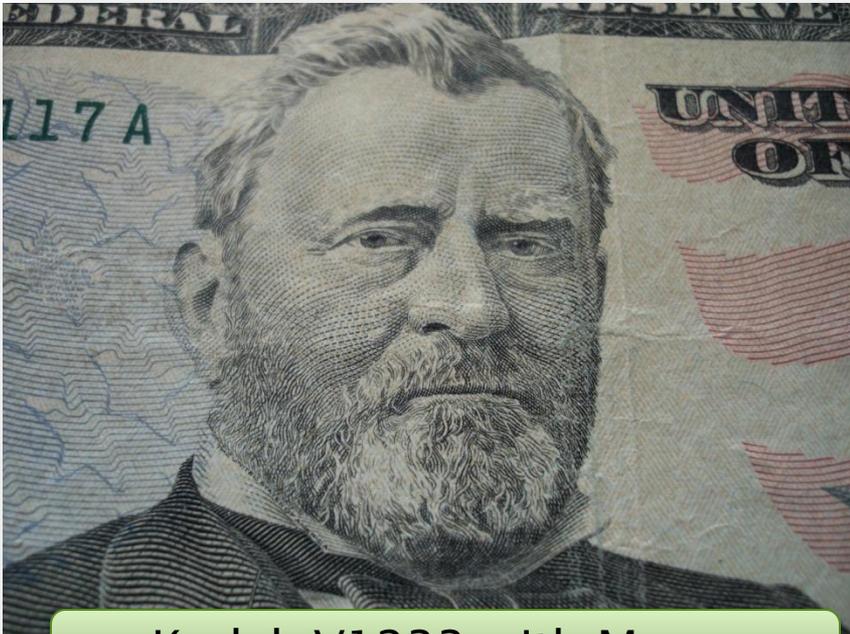
How does the “Out of Focus” indicator work?

	Canon SD3500	Casio FH100	Fuji F80EXR	Kodak M580	Nikon S8000	Olympus 7040	Panasonic DMC-ZS5	Pentax H90	Samsung HZ35W
In-Focus	Green Box	No	Green Box	Green Box	Green Box	Green Box	Green Box	Green Box	Green Box
Out-of-Focus (Visual)	No	Red Box	Red !AF	Red AF	Flash Red Box	Flash Red Box	Red camera *	No	Red Box
Out-of-Focus (Sound)		No beep	No beep						New beep

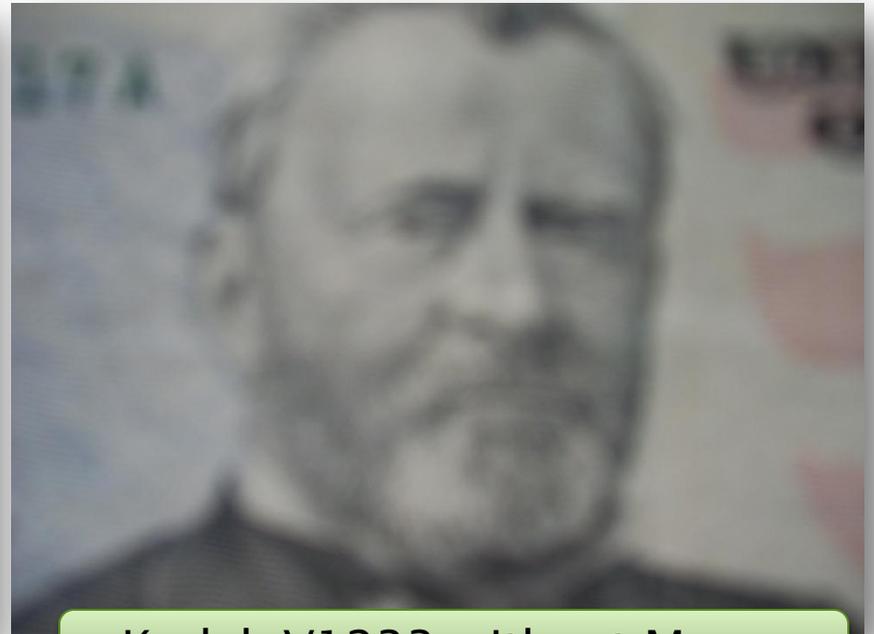
* Plus Focal Range Green dot flashing

Why Macro?

... allows for closest approach to subject



Kodak V1233 with Macro



Kodak V1233 without Macro

Trends for 2010

- - Auto Macro - -

	Canon SD3500	Casio FH100	Fuji F80EXR	Kodak M580	Nikon S8000	Olympus 7040	Panasonic DMC-ZS5	Pentax H90	Samsung HZ35W
Auto Macro	Yes	Yes, But*	Yes	Yes	Yes, But**	Yes	Yes	Yes	Yes

*Does not work very well.

**Auto macro works to 16cm, manual macro to 1cm

Most 2010 cameras do not have “auto macro.” However, all 10 of the cameras we selected, do have it.

In 2009, only 6 of the 10 cameras we selected had “auto macro,” and several of them did not work very well.



Trends for 2010

- - In-Camera Charging - -

	Canon SD3500	Casio FH100	Fuji F80EXR	Kodak M580	Nikon S8000	Olympus 7040	Panasonic DMC-ZS5	Pentax H90	Samsung HZ35W
In-Camera c USB	No	No	No	Yes	Yes	Yes	No	No	Yes
In-Camera c AC	No	No	No	Yes	Yes	Yes	No	No	Yes

Most 2010 cameras do not have “in-camera charging.” However, four of the cameras we selected, do have it.

No more docking stations or camera cradles, except for Kodak.

Batteries: Power to the System

- ▶ Rechargeable vs Disposable
- ▶ Standard vs Proprietary Form Factor (Shape)
- ▶ Battery Technology
 - e.g. Alkaline, LiMH, NiCad, NiMH, ... **2010 Cameras = All LiMH**
- ▶ Charger Options
 - Docking Station
 - USB Cable
 - AC Adapter
 - External Charger
- ▶ Don't ignore power consumption



*Examples of AA Batteries
Ni-MH Battery Pack, Ni-MH,
and Alkaline*



*Examples of
Lithium Ion
Batteries for
Casio, Kodak and
Sony Cameras*

Image Review – Methods

Hint

Once you have a “Gold Standard” or “Reference” camera, you can test new cameras against those images

- ▶ Begin with default setting on all cameras
 - Make sure settings are not terribly different
- ▶ Take photographs of the same subjects under the same lighting conditions
- ▶ Compare the images side by side
- ▶ Rate each image for
 - Color
 - Detail
 - Ratings are made relative to the appearance of the true object (color)

Record For Each Test Image ...

- ▶ Image Resolution (Megapixels)
- ▶ Compression Setting
- ▶ Flash Setting
- ▶ Flash Fired?
- ▶ Flash Level
- ▶ Optical Zoom Setting
- ▶ Macro Setting
- ▶ Background
- ▶ Lighting
- ▶ Distance to Object
- ▶ Object Description
- ▶ Subject
- ▶ Camera mounting system

Image Quality Review

- ▶ It is important to put the cameras into similar modes with similar settings
- ▶ This is tedious and imperfect
- ▶ What is “Auto?”



Image Quality Review

– Comparable Camera Settings –

Capture Mode (minimal)

- ▶ Capture
- ▶ Auto setting
- ▶ Auto Macro
- ▶ Picture size
- ▶ Compression
- ▶ Image Stabilization
- ▶ Auto focus
- ▶ Auto focus zone
- ▶ Exposure metering
- ▶ Color mode
- ▶ Red eye pre-flash
- ▶ Maintain flash settings
- ▶ Video out
- ▶ Video size
- ▶ Video quality

- Comparable Camera Settings -

Feature Choices	Canon SD3500	Casio FH100	Fuji F80EXR	Kodak M580	Nikon S8000	Olympus 7040	Panasonic DMC-ZS5	Pentax Optio H90	Samsung HZ35W
CAPTURE									
Auto Setting	Auto	Box Icon Auto	EXR Auto	Smart Capture	Auto Mode	iAuto	iAuto	Auto Pict	Smart Auto
Auto Macro	Yes								
Picture Size (MP): 12, 10.7, 9, 6, 3.1, 2.2, 2.1, 1.2	5	7	6	6	5	5	5	5	5
Compression or Quality	Fine	Fine	Fine	Unknown	Unknown	Fine	Fine?	Unknown	Fine
Image Stabilization	Continuous	Antishake	Continuous	Unknown	On	On	Auto	?	?
Exposure Metering: Multi-pattern, Center Weight, Center Spot	Auto								
Auto Focus Control (Still): Single AF, Continuous AF			Single	Continuous	Continuous	Unknown	Continuous	Single	Continuous
AF Zone :Multi-Zone, Center-Zone	Evaluative	Spot -retains-	Face, center	Face	Center, can set	Face, iESP	Face	Face, center	Face, multi
In-Focus Indicator	Green Box		Green Box						
CAPTURE Advanced									
Color Mode:	Unknown	Neutral	Standard	High	Neutral	Unknown	Standard	Neutral	Normal
White Balance	Auto								
ISO Speed: Auto, 64, 100, 200, 400, 800, 1600, 3200	Auto								
Red Eye Preflash: On, Off	On	Unknown	On	On	On	On	On	Off	On
Maintains flash setting in Auto	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No
Programable Maintain Settings:	No								
SET UP	Standard Settings								
VIDEO									
Video Out: NTSC, PAL	NTSC								
Video Size: 1280 x 720 HQ, 1280 x 720, 640 x 480 HQ, 320 x 240	1280 x 720 & 640 x 480								
Quality Setting	None	None	None	None	None	Fine	None	None	None

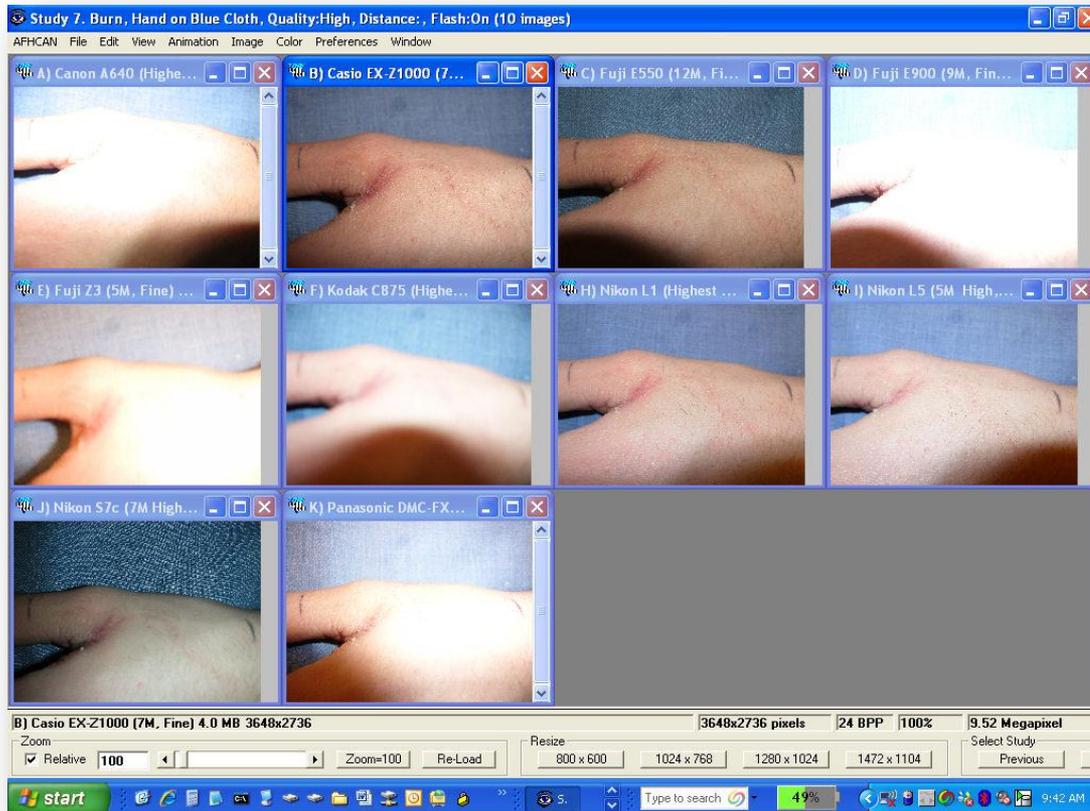
Image Quality Review



Analysis Tools

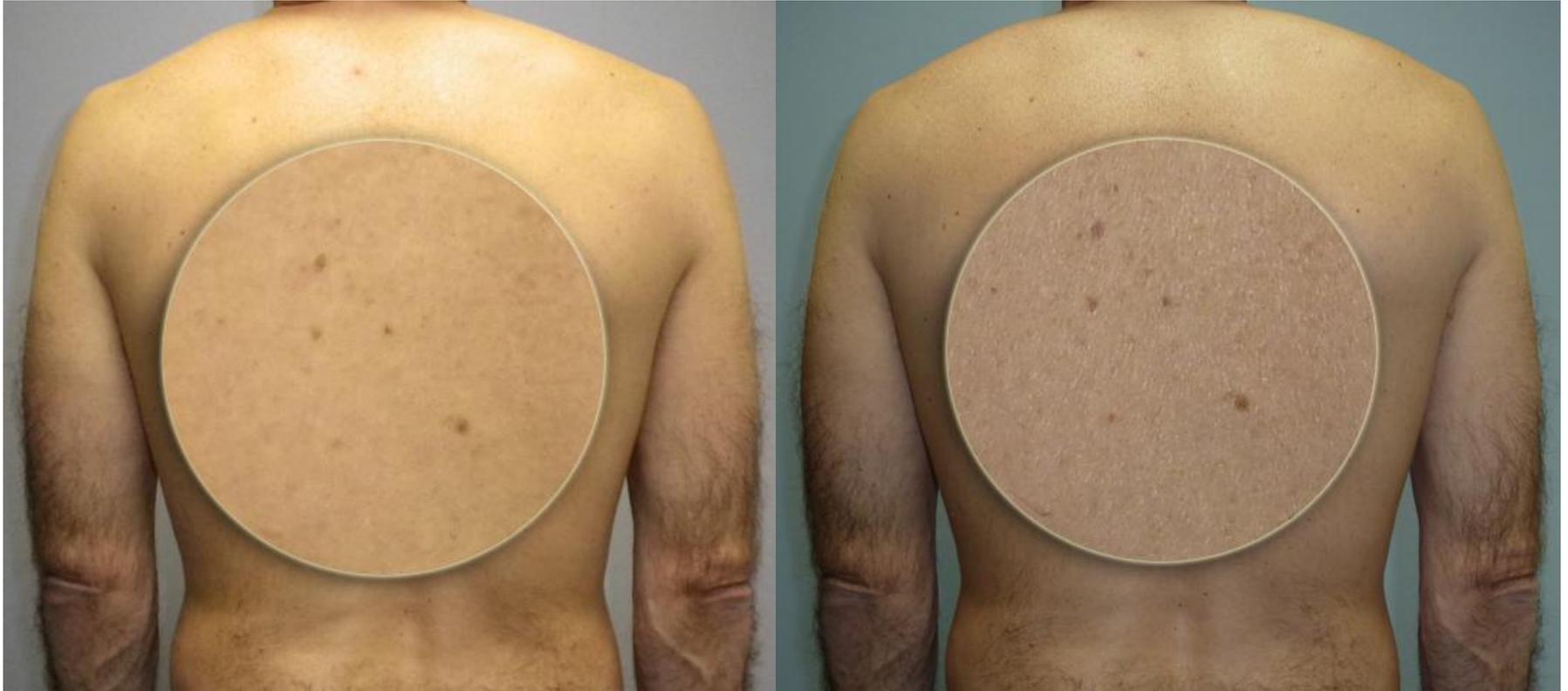
How do we compare images from many different digital cameras?

Measuring Color and Detail



- ▶ Detail of an image is difficult to assess
- ▶ Need to compare images side by side
- ▶ Need to be able to zoom in

Image Quality Review – Back



Pentax H90

Panasonic DMC-ZS5

Image Quality Review – Ankle



Pentax H90



Panasonic DMC-ZS5

Image Quality Review – Eye

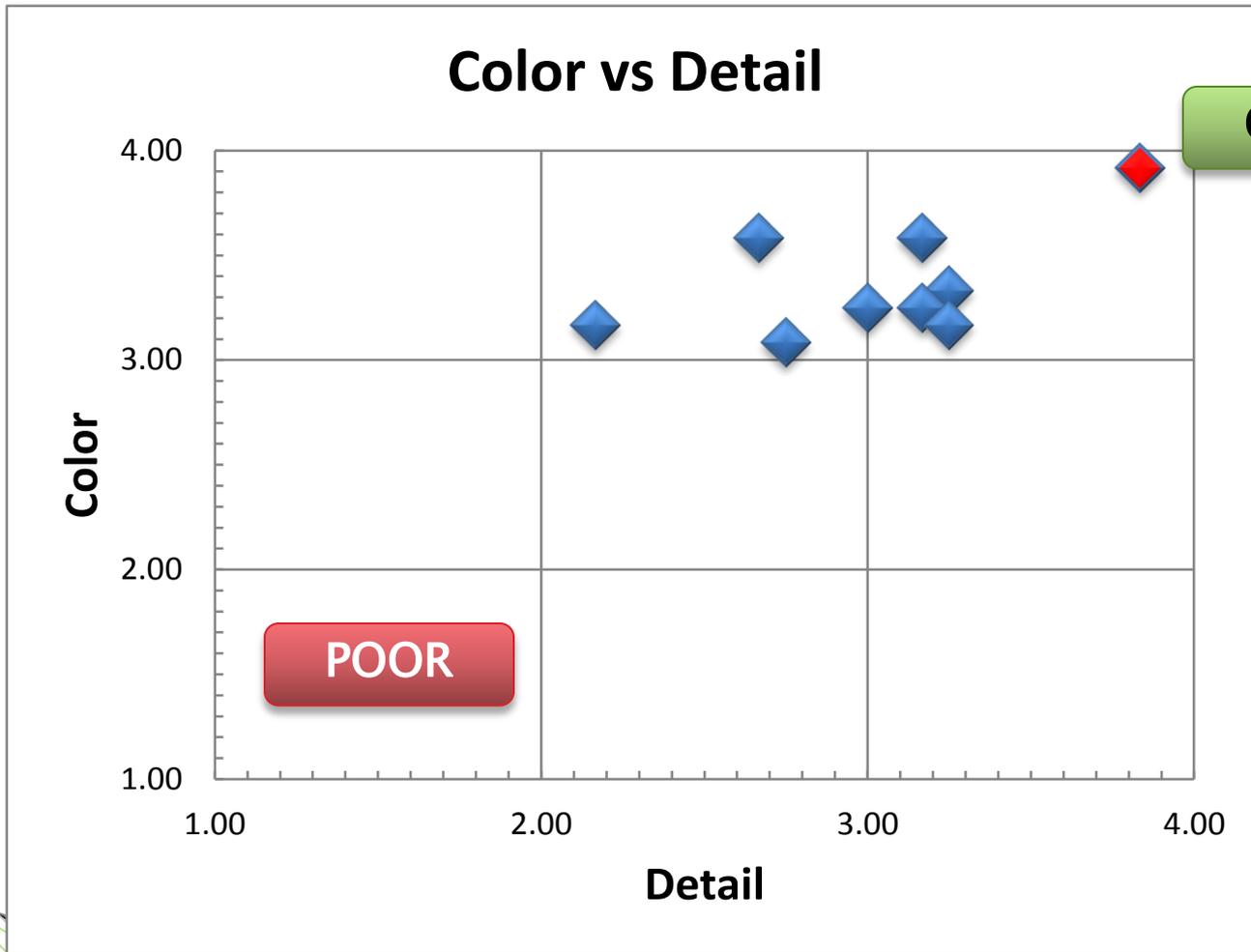


Olympus 7040

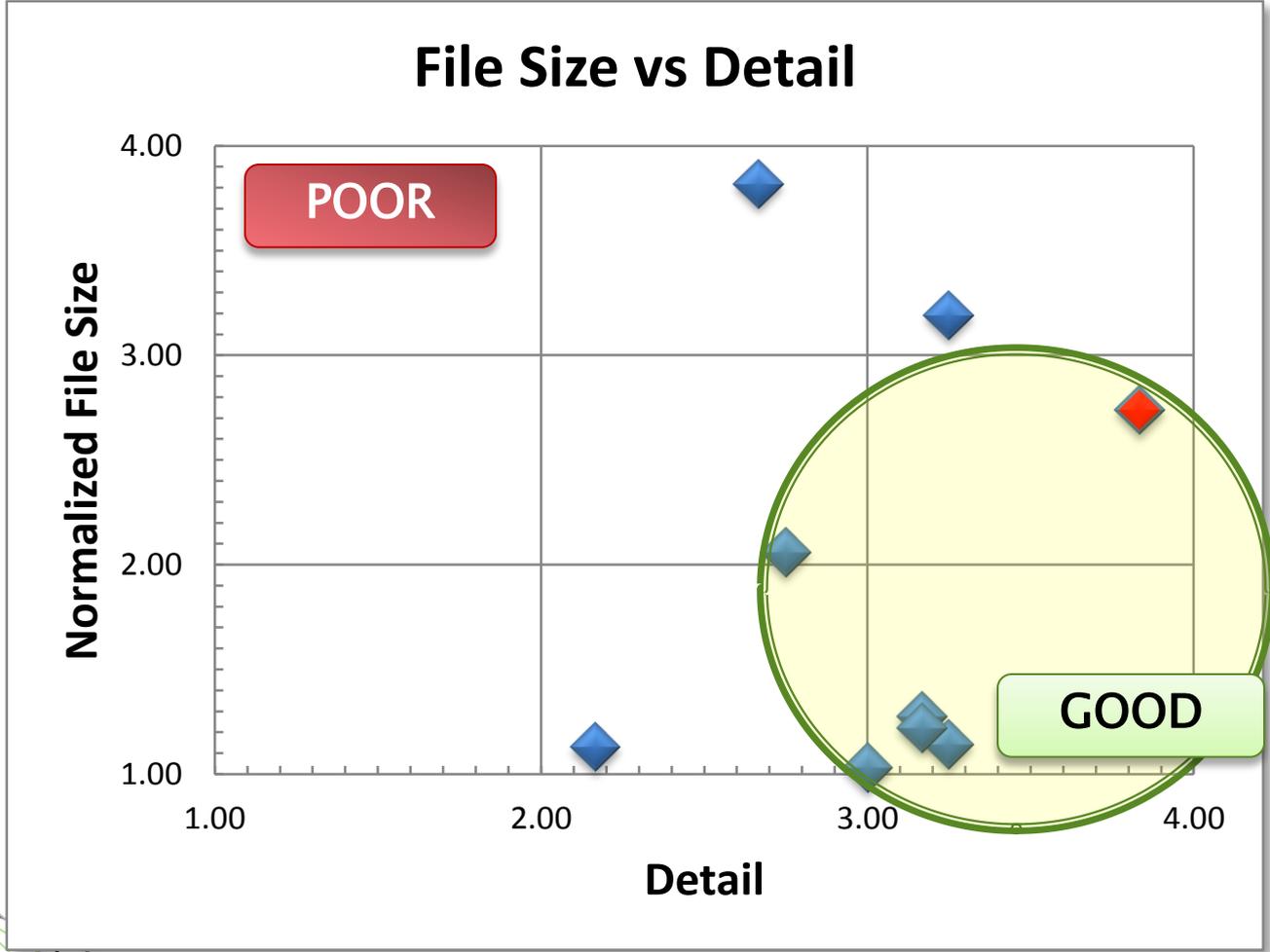


Kodak M580

Test Results



Details – But at what expense?



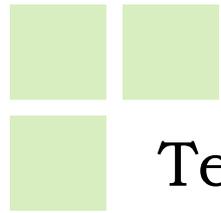
Exercise of Exclusion – 2010 Cameras –



- ▶ Canon PowerShot SD3500 IS
- ▶ Casio EXILIM EX-FH100
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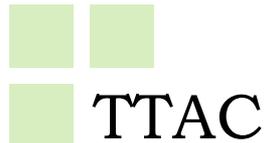
Conclusion?

- ▶ Digital cameras are constantly changing
 - Last year's winner is sometimes this year's dud
 - Plan on regular reviews – cameras are frequently discontinued
- ▶ Technology assessment is a skill
 - Building upon previous experience is useful
 - Keep great records
 - Use consistent tools
 - Share your results and experiences!



Telehealth Technology Assessment Center

For additional information, please visit our website at www.telehealthtac.org or email info@telehealthtac.org.



Thank you to the AFHCAN staff for assisting in the camera evaluation process and the preparation of this presentation.

