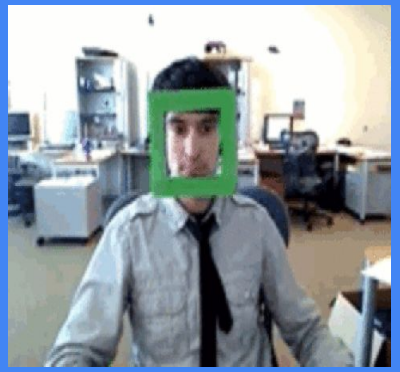
Patterns for Camera calibration using OpenCV and Ring pattern

Third approach

wilderd Mamani & Roxana Soto



Outline for Today

Pipeline improving(not canny)
Implementacion using OpenCV

- Patterns: CHESSBOARD, CIRCLES_GRID, ASYMMETRIC_CIRCLES_GRID
- Time analysis

Rings Time vs 3 openCV patterns

- Frames por seconds
- Total frames for pattern recognition

A calibration view

Our Pipeline

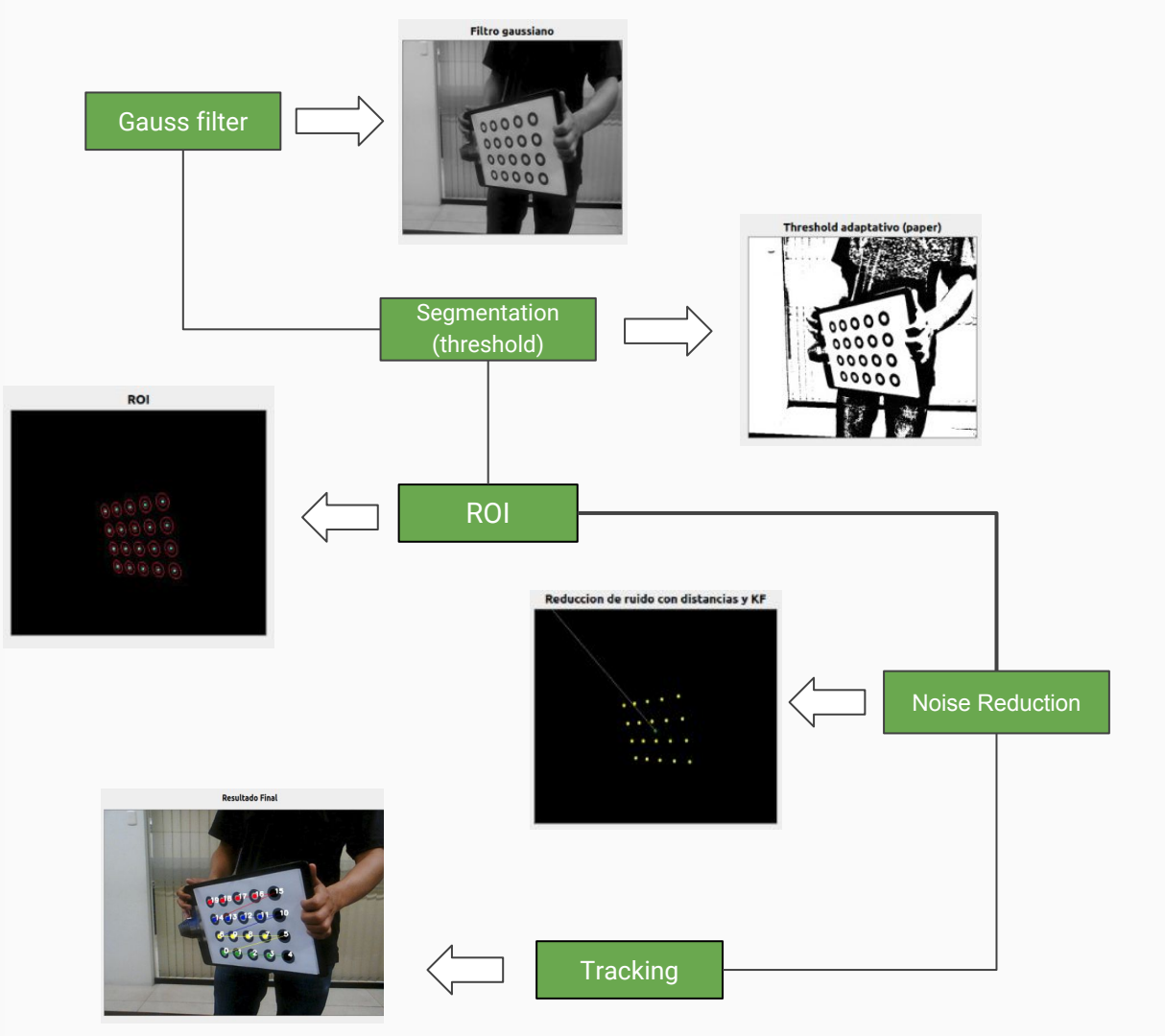
Canny increase more noise

Noise Reduction :

- DFS,MET,AM

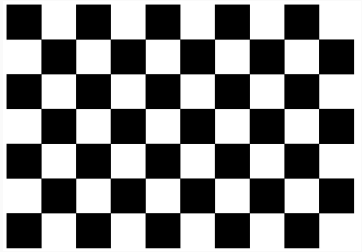
Tracking:

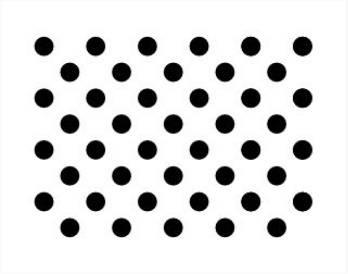
- Rectangle Rotation
- Using minAreaRect

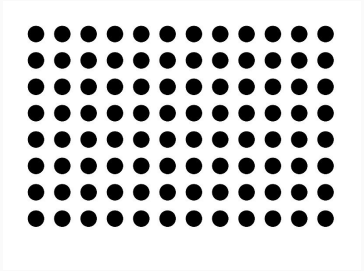


Implementation using OpenCV

Patterns: CHESSBOARD, CIRCLES_GRID, ASYMMETRIC_CIRCLES_GRID







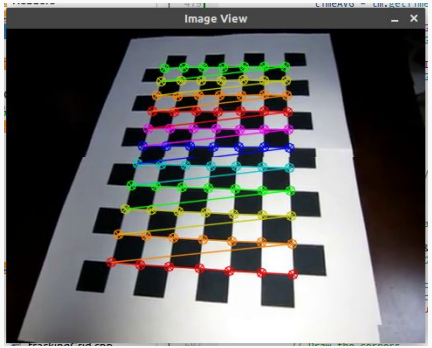
Time Analysis(Other examples)

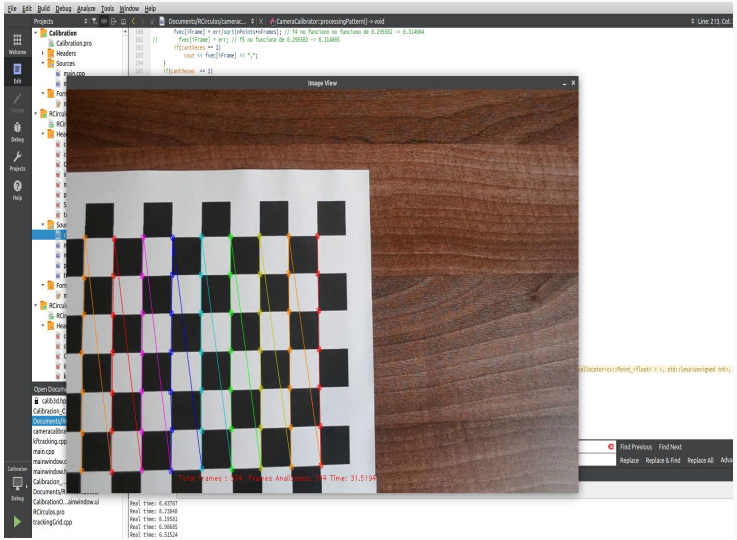
Patter chesboard:

Total Frames: 670
Frames Analizados: 618
Time avg: 4.18415 ms

Video info:

Dimension 480x360
Framerate 30 frames per second
Bitrate 541 kbps





Rings Time vs 3 OpenCV patterns(examples old)

table rings(left) vs circle(right) & chessboard opencv

Videos	Total Frames	Frames Analizados	Analisis %	AVG (ms)
Video1	5972	5281	88.42	8.13
Video2	5144	4425	86.02	8.95

Pattern (video)	Total Frames	Analysis Frames	Analysis %	Time AVG (ms)
Chessboard	670	618	92.2388%	4.18415 ms
Circle Asimetric	923	882	95.557%	7.26863e-3 10 ms
Circle Symetric	653	633	96.937%	7.1618e-31 0 m s

Actividades RCirculos jue 16:57

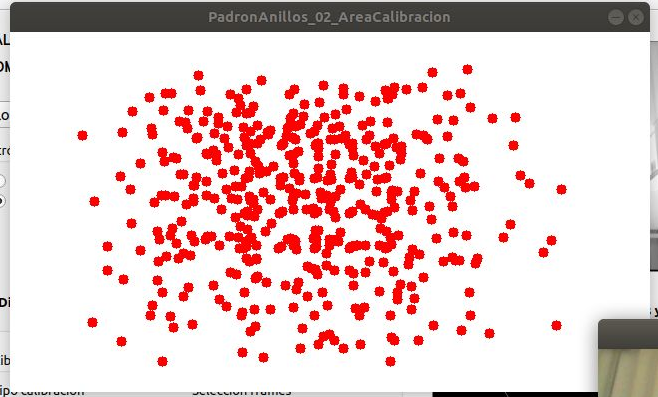
PatronCircular (copia)/RCirculos/cameracalibrator.cpp @ RCirculos - Qt Creator

File Edit Build Debug Analyze Tools Window Help

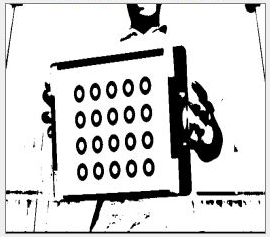
Camera Calibration

: 219, Col: 41

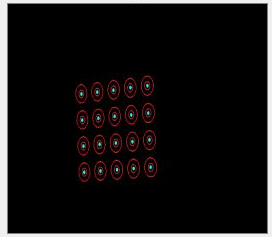
PadronAnillos_02_AreaCalibracion



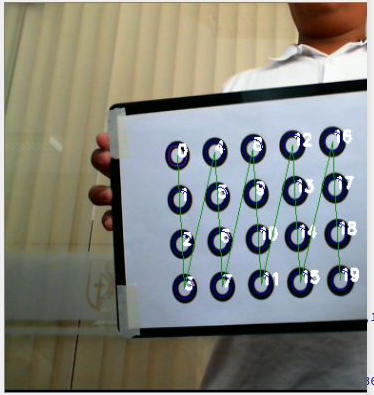
Threshold adaptativo (paper)



ROI



Resultado Final



RESULTADO FINAL

No calibrar
Calib. OpenCV

Manual
Por intervalos

N° frames: 25

Fix Aspect Ratio
Fix Principal Point
Zero Tangent Dist
Guardar parámetros
Usar undistort

Salida: output.xml

Start

RMS = 0.681846

Distancia

Calcular distancia a cámara

Archivo:

1270,1282,1295

364,369,371,374

78,485,493,500,

All Advanced...

FRAME: 203 -> SIZE CENTERS: 20
FRAME: 211 -> SIZE CENTERS: 20
folderOutVideoPadronAnillos_02

CalibrationO...inwindow.cpp
PatronCircula...ainwindow.cpp
PatronCircula...ainwindow.cpp

Type to locate (Ctrl...

1 Issues 147 2 Search Results 3 Application Output 4 Compile Output 5 Debugger Console 7 Version Control 8 Test Results

A Calibration View(Videos of Professor)

PadronAjedrez_01		NroFrames	30
CameraMatrix	691.375231	0	322.338726
	0	690.694387	268.250375
	0	0	1
RMS	0.588431634		
Time(ms)	10.8052		

PadronAjedrez_02		NroFrames	30
CameraMatrix	543.6087974	0	286.261332
	0	542.951142	176.25501
	0	0	1
RMS	0.464893359		
Time(ms)	11.6288		

Circulos_01 Asimetrico1		NroFrames	30
CameraMatrix	735.232922	0	365.312003
	0	747.453121	270.416452
	0	0	1
RMS	0.46032502		
Time	0.00E+00		

Circulos_01 Asimetrico2		NroFrames	30
CameraMatrix	491.667249	0	335.705767
	0	494.66104	173.704643
	0	0	1
RMS	0.22447361		
Time	7.24602e-310		

Ring_01 Simetrico		NroFrames	30
CameraMatrix	715.726597	0	453.863777
	0	712.11748	354.352896
	0	0	1
RMS	7.54		
Time			

Ring_02 Simetrico		NroFrames	50
CameraMatrix	501.269921	0	324.569284
	0	503.930261	189.466954
	0	0	1
RMS	0.55801105		