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# Appendix

## Appendix A

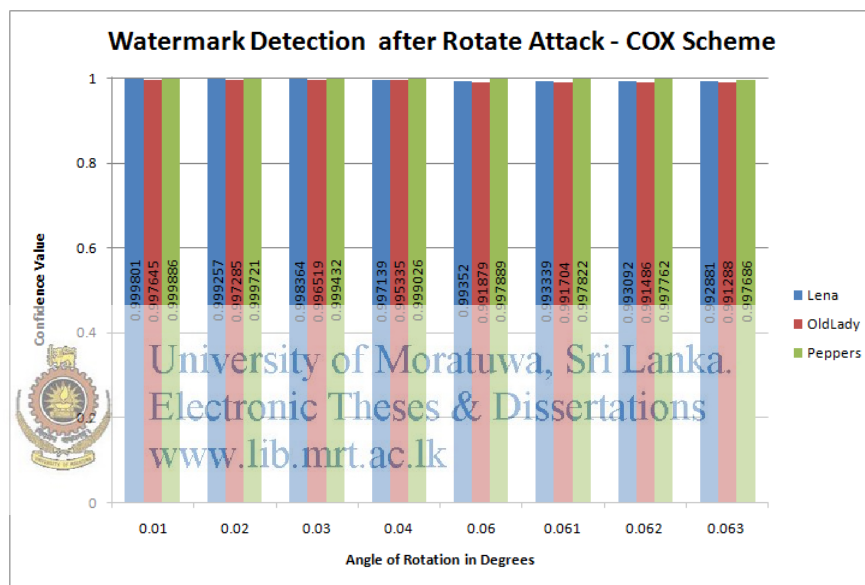


Figure 5.22: Rotation:COX Scheme(Method:Bicubic)

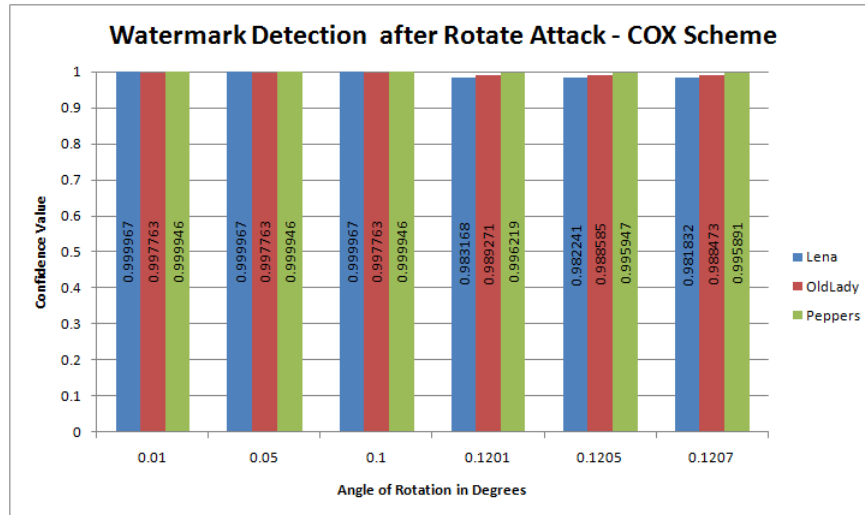


Figure 5.23: Rotation:COX Scheme(Method:Nearest)

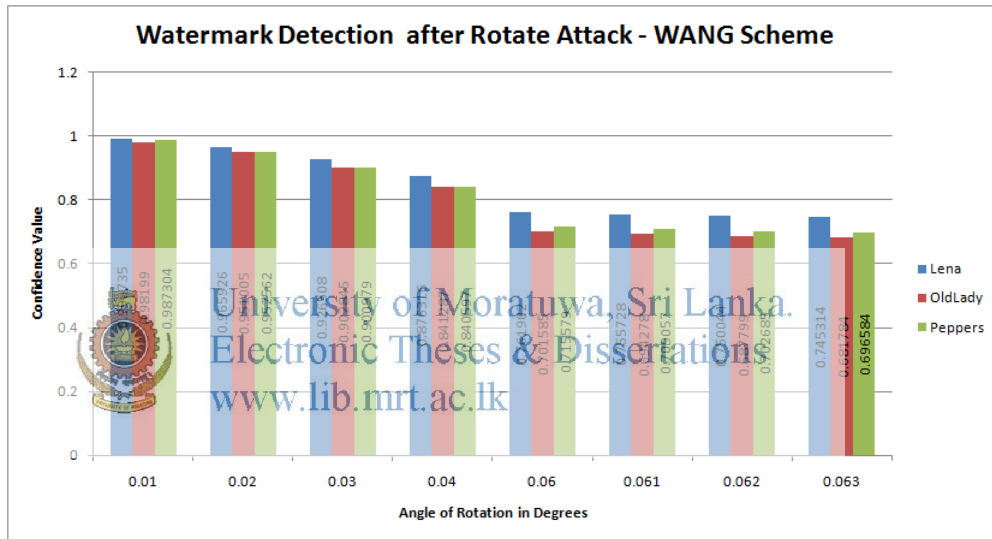


Figure 5.24: Rotation:WANG Scheme(Method:Bicubic)

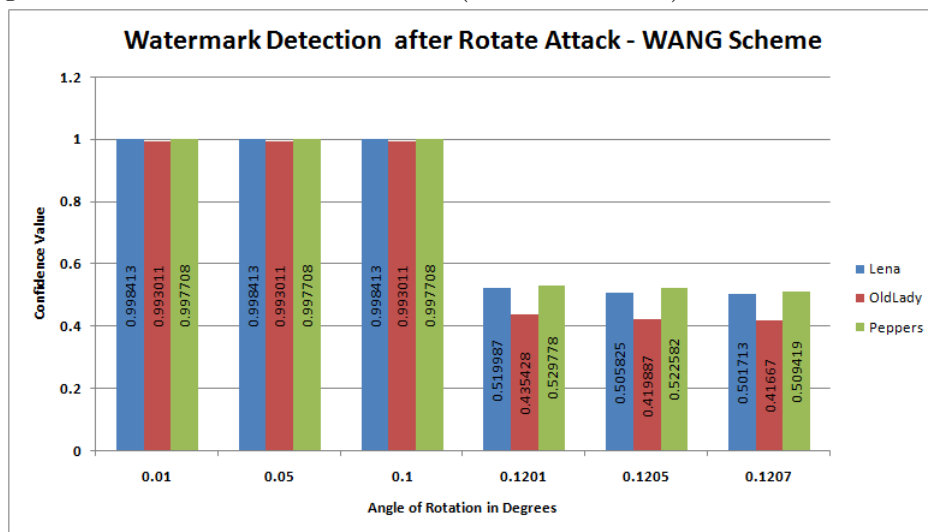


Figure 5.25: Rotation:WANG Scheme(Method:Nearest)



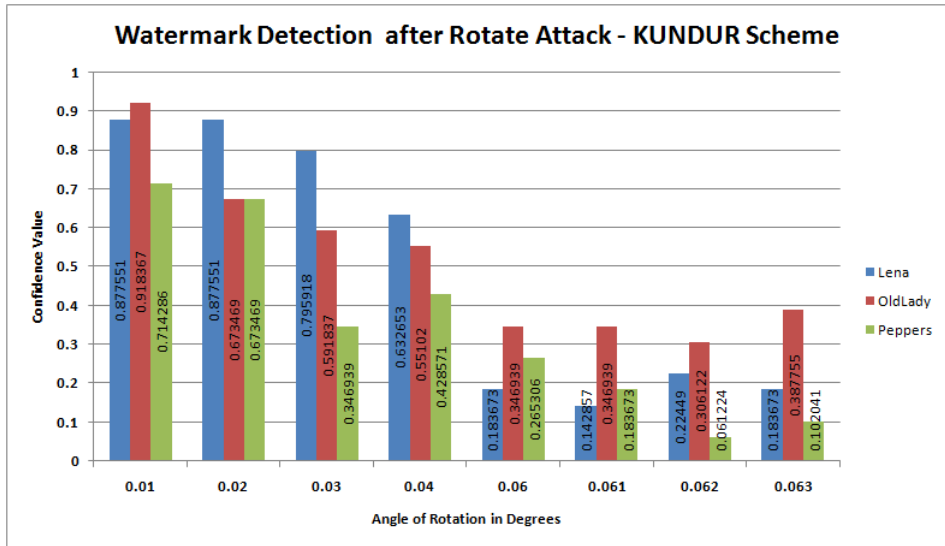


Figure 5.26: Rotation:KUNDUR Scheme(Method:Bicubic)

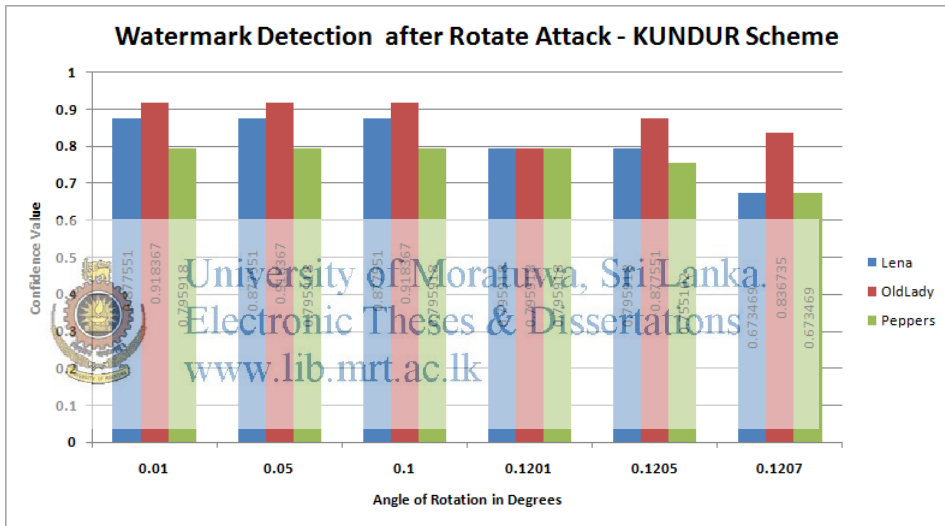


Figure 5.27: Rotation:KUNDUR Scheme(Method:Nearest)

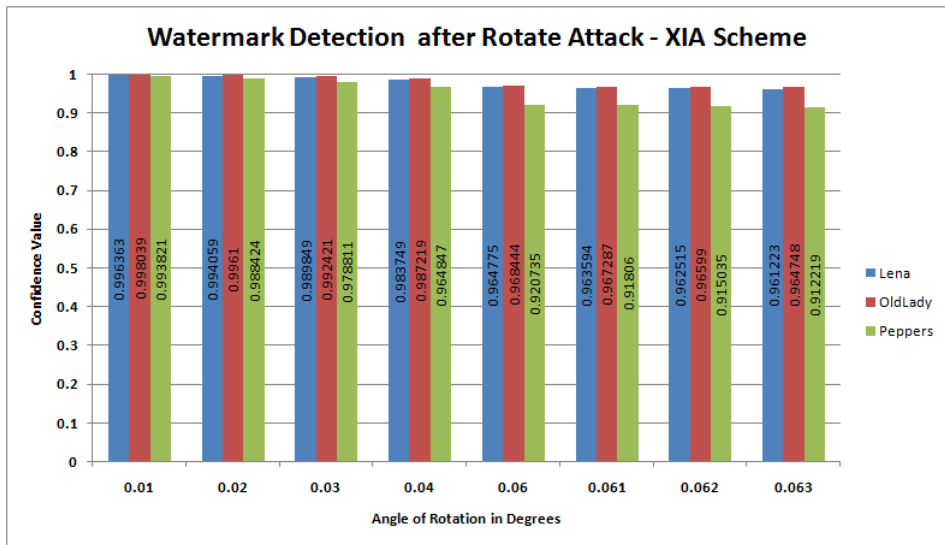


Figure 5.28: Rotation:XIA Scheme(Method:Bicubic)

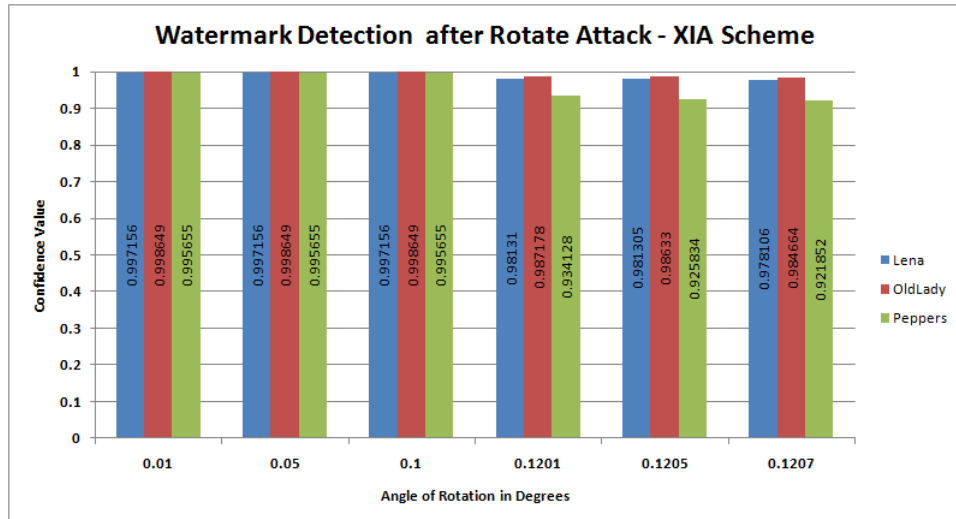


Figure 5.29: Rotation:XIA Scheme(Method:Nearest)

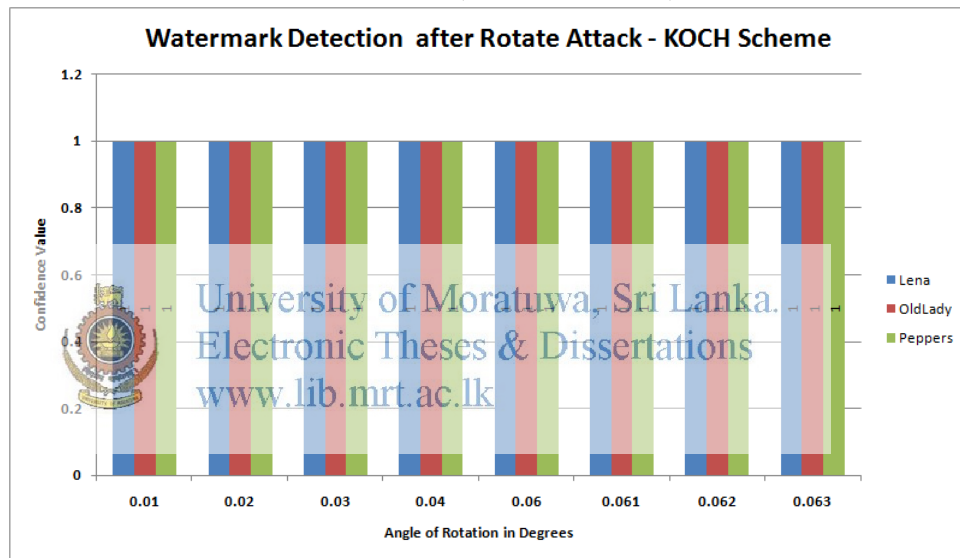


Figure 5.30: Rotation:KOCH Scheme(Method:Bicubic)

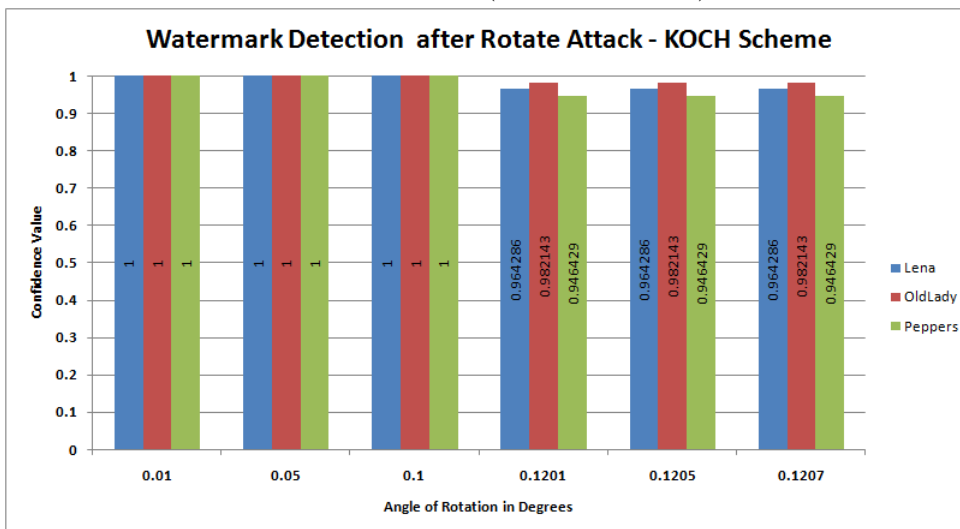


Figure 5.31: Rotation:KOCH Scheme(Method:Nearest)

## Appendix B

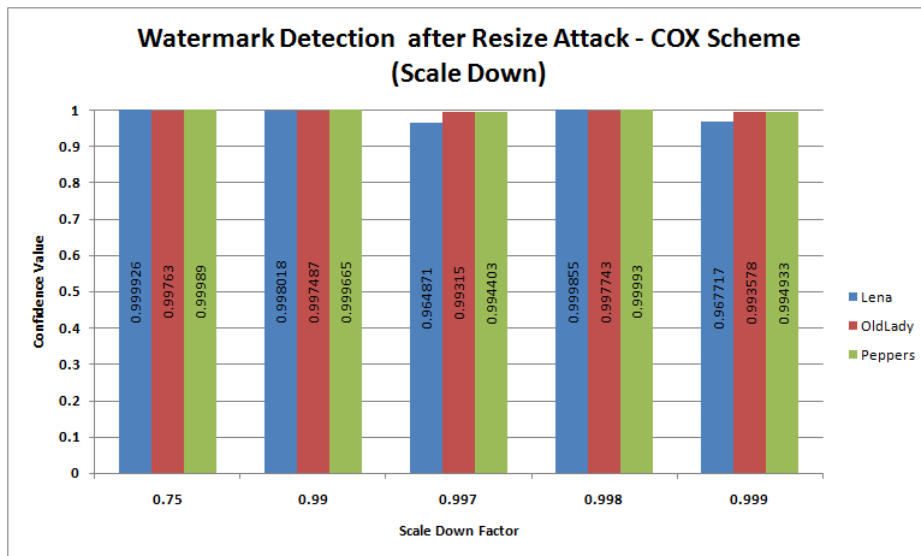


Figure 5.32: Resize:COX Scheme(Scale Down)

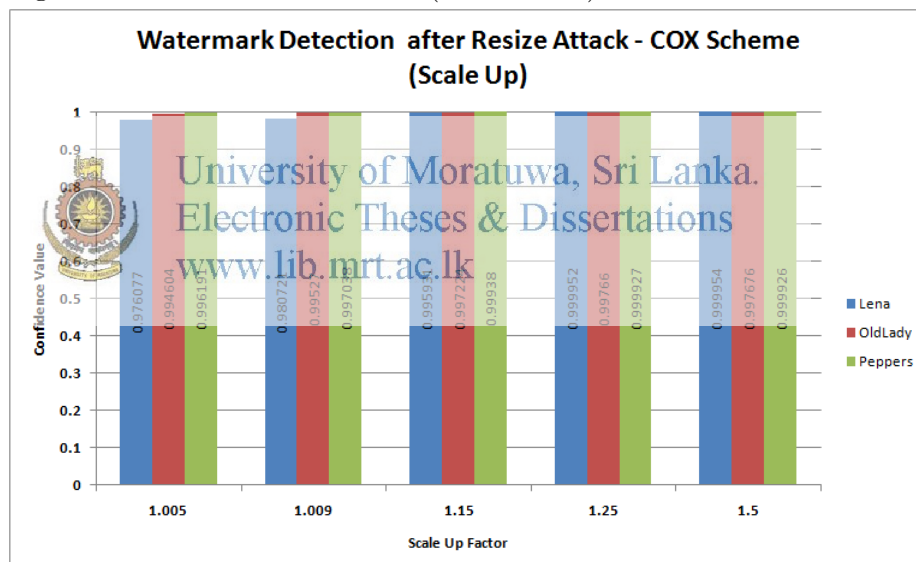


Figure 5.33: Resize:COX Scheme(Scale Up)

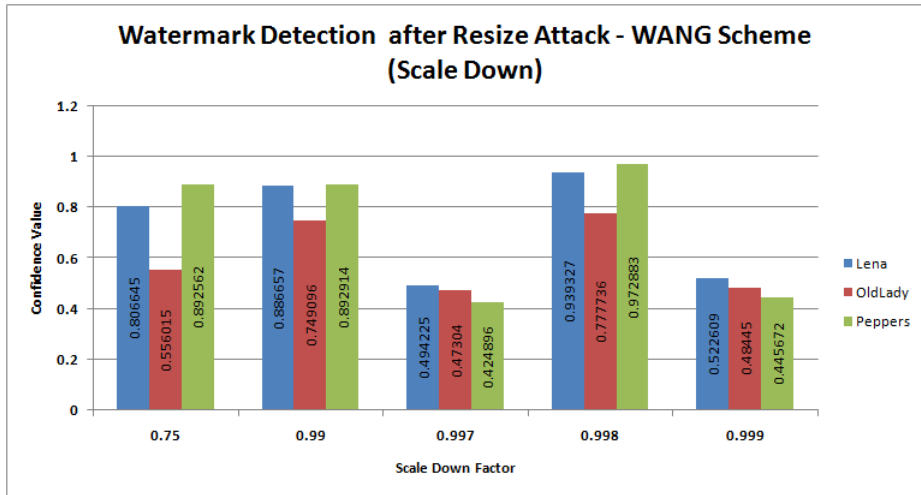


Figure 5.34: Resize:WANG Scheme(Scale Down)

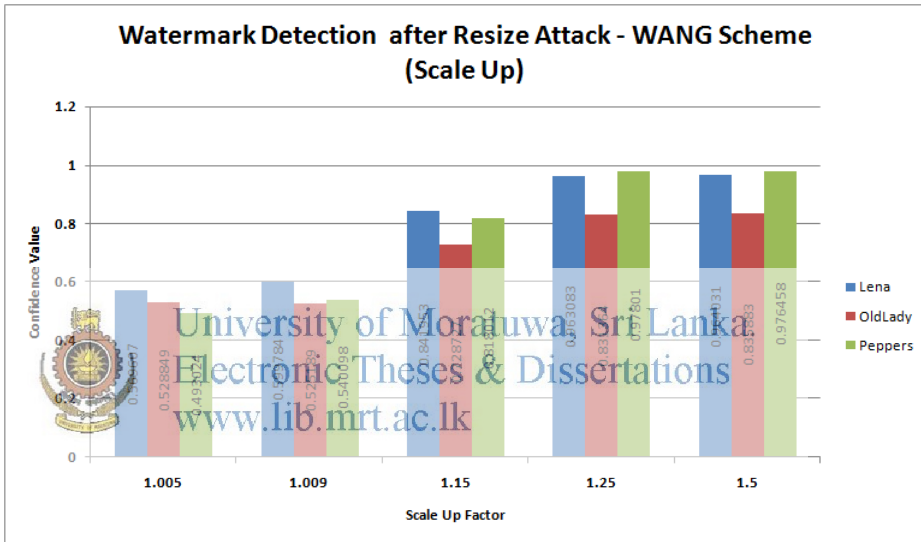


Figure 5.35: Resize:WANG Scheme(Scale Up)

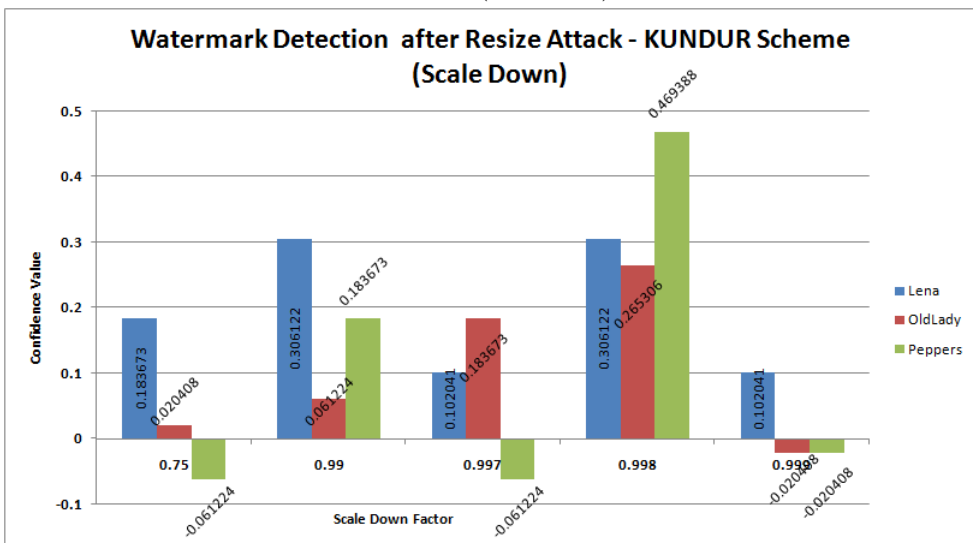


Figure 5.36: Resize:KUNDUR Scheme(Scale Down)

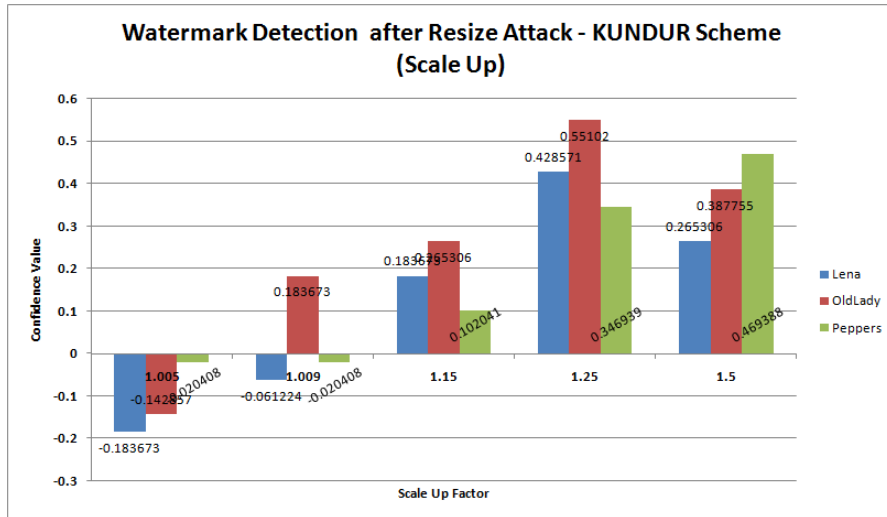


Figure 5.37: Resize:KUNDUR Scheme(Scale Up)

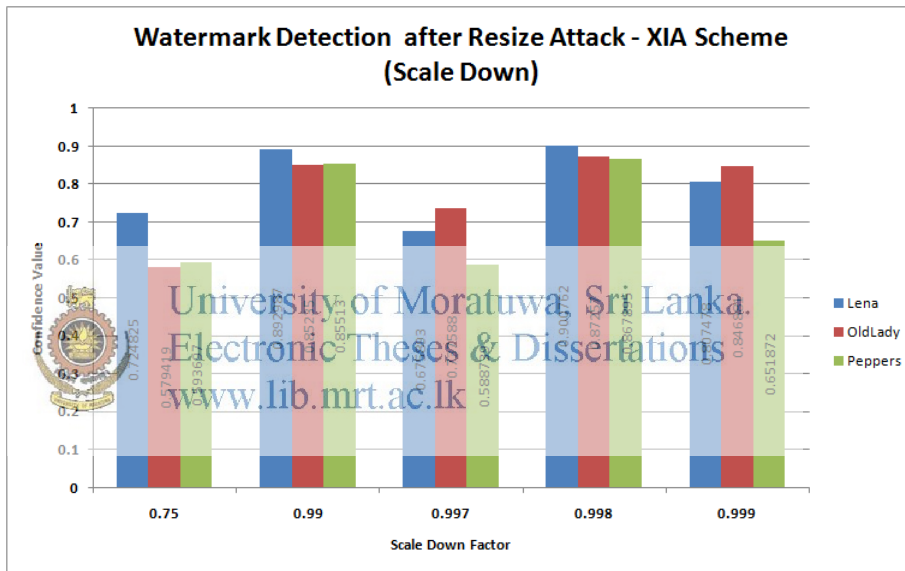


Figure 5.38: Resize:XIA Scheme(Scale Up)

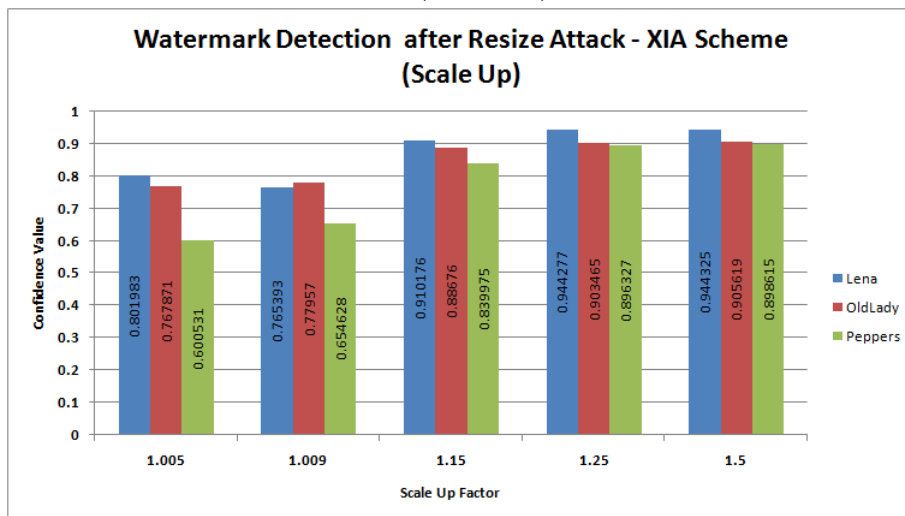


Figure 5.39: Resize:XIA Scheme(Scale Up)

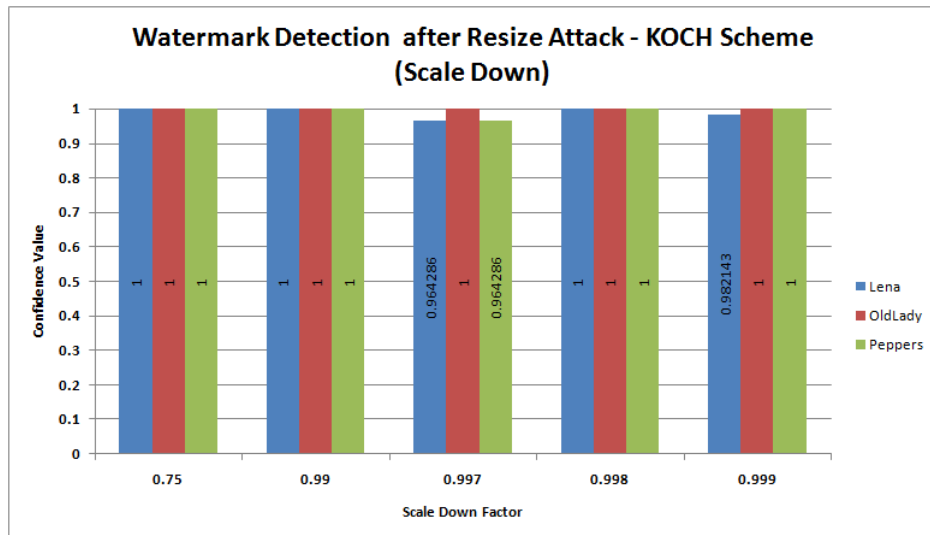


Figure 5.40: Resize:Koch Scheme(Scale Down)

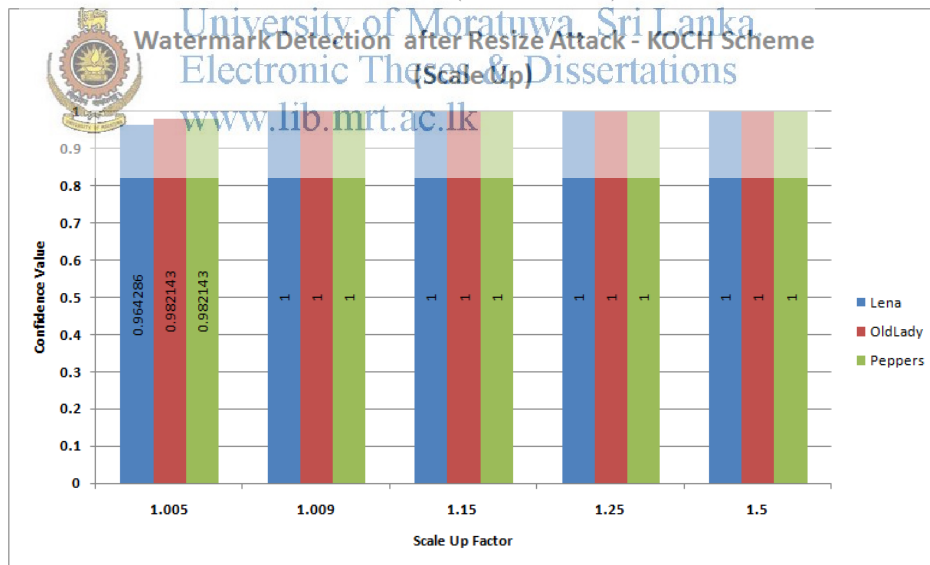


Figure 5.41: Resize:Koch Scheme(Scale Up)

## Appendix C

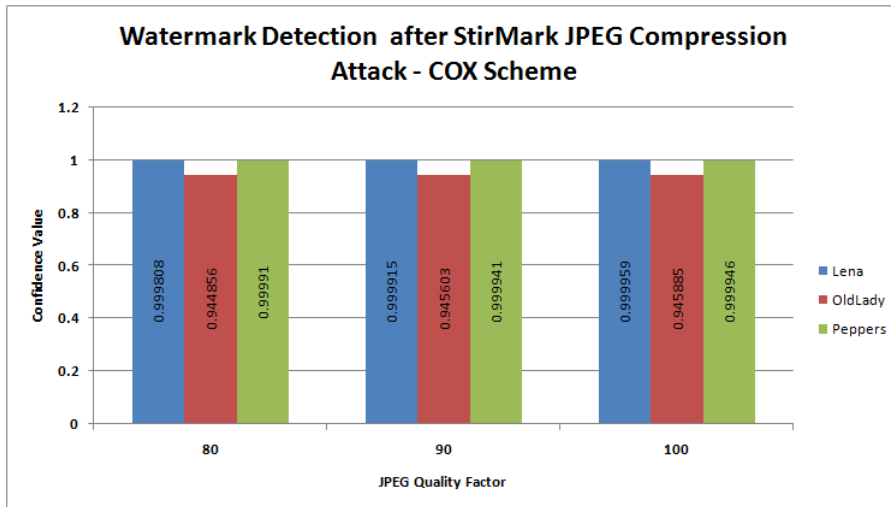


Figure 5.42: JPEG Compression:COX Scheme

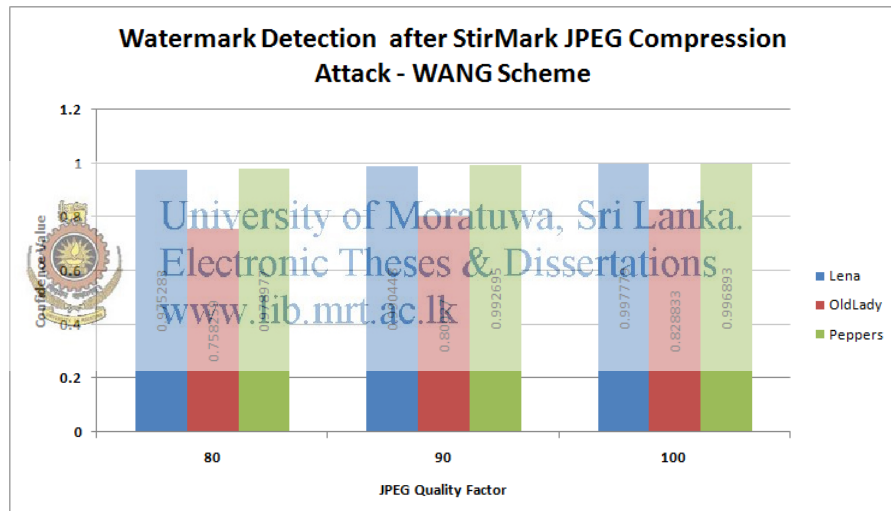


Figure 5.43: JPEG Compression:WANG Scheme



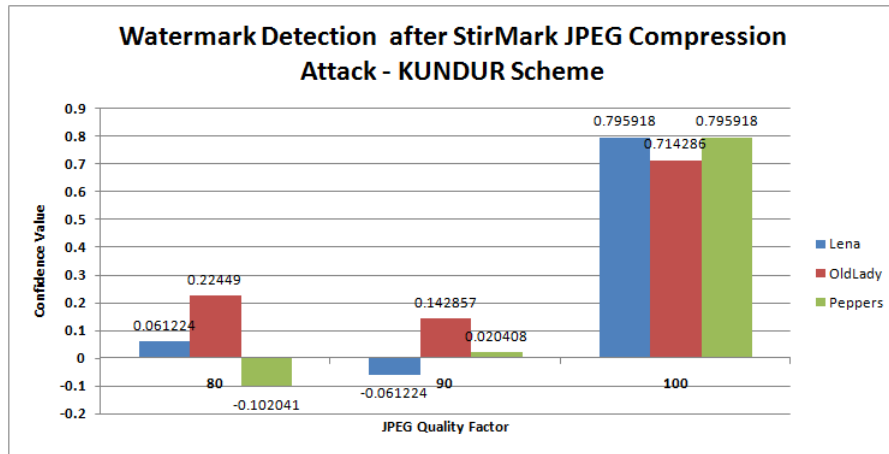


Figure 5.44: JPEG Compression:KUNDUR Scheme

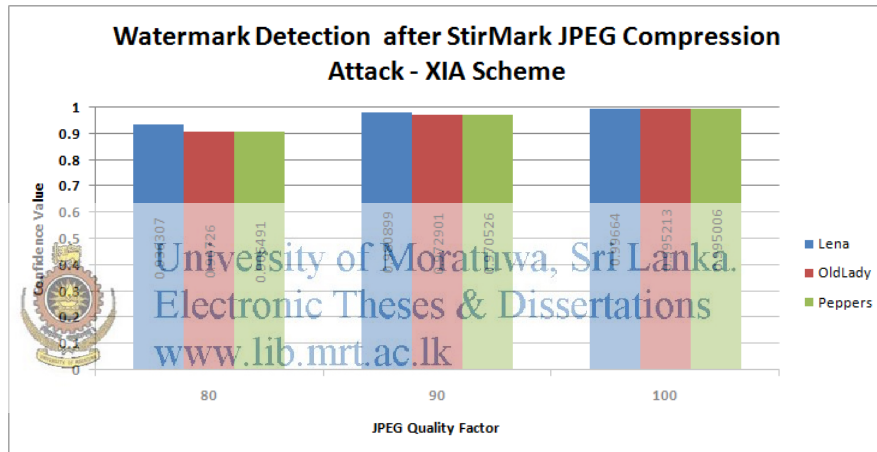


Figure 5.45: JPEG Compression:XIA Scheme

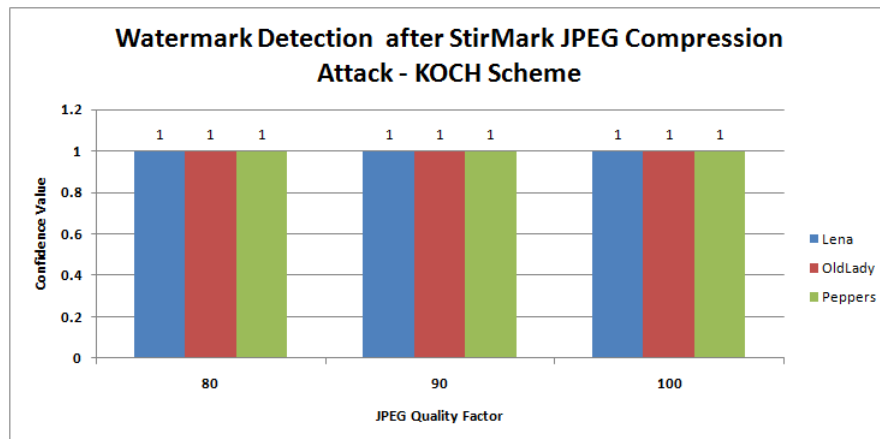


Figure 5.46: JPEG Compression:KOCH Scheme

## Appendix D

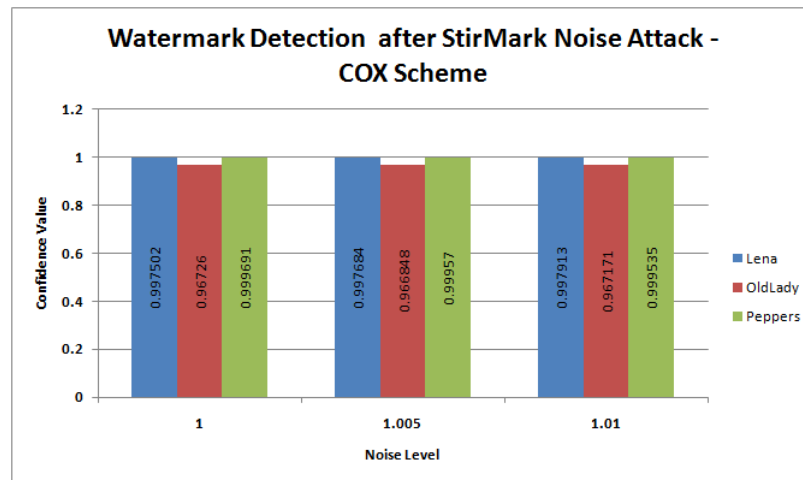


Figure 5.47: Noise Attack:COX Scheme

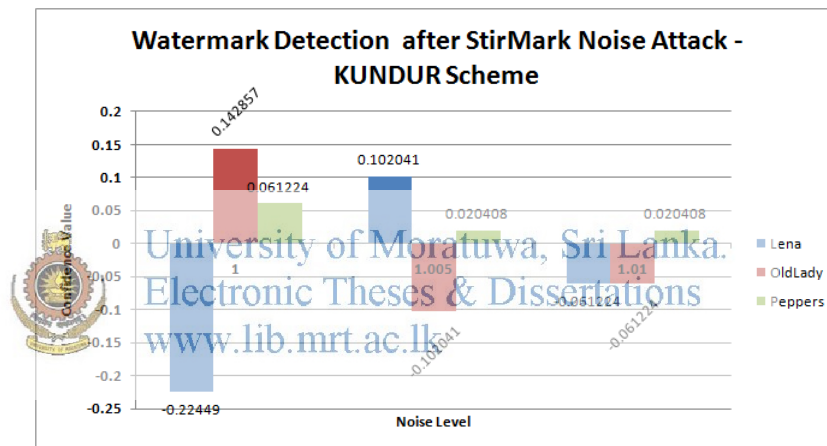


Figure 5.48: Noise Attack:KUNDUR Scheme

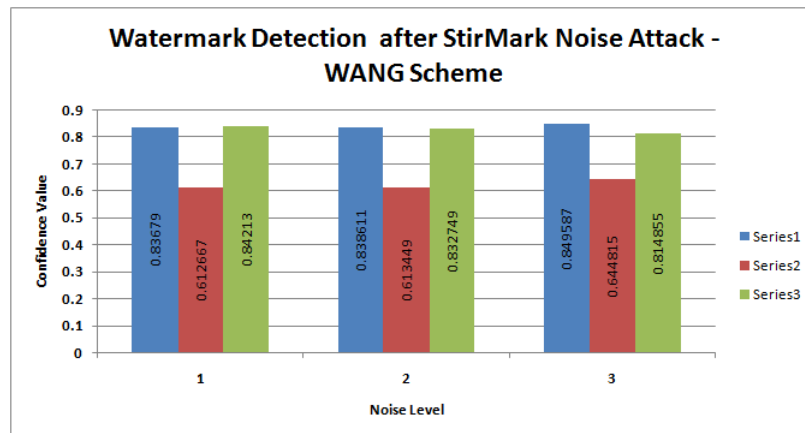


Figure 5.49: Noise Attack:WANG Scheme

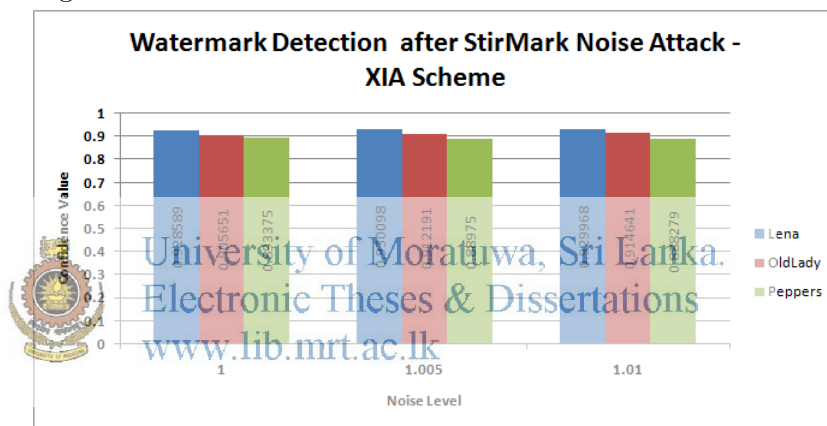


Figure 5.50: Noise Attack:XIA Scheme

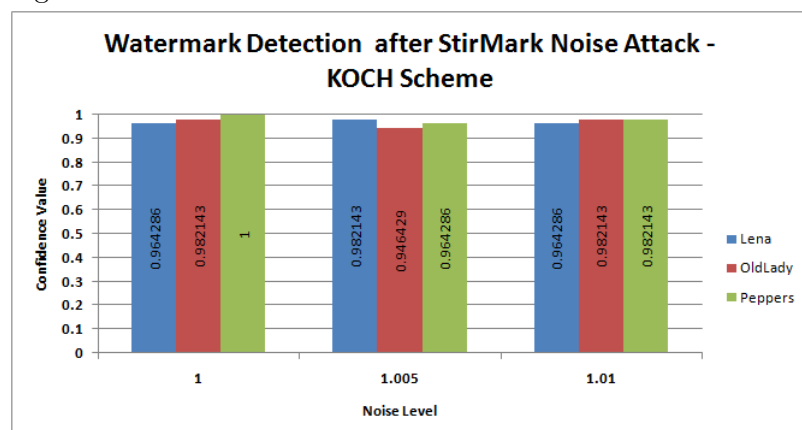


Figure 5.51: Noise Attack:KOCH Scheme

## Appendix E

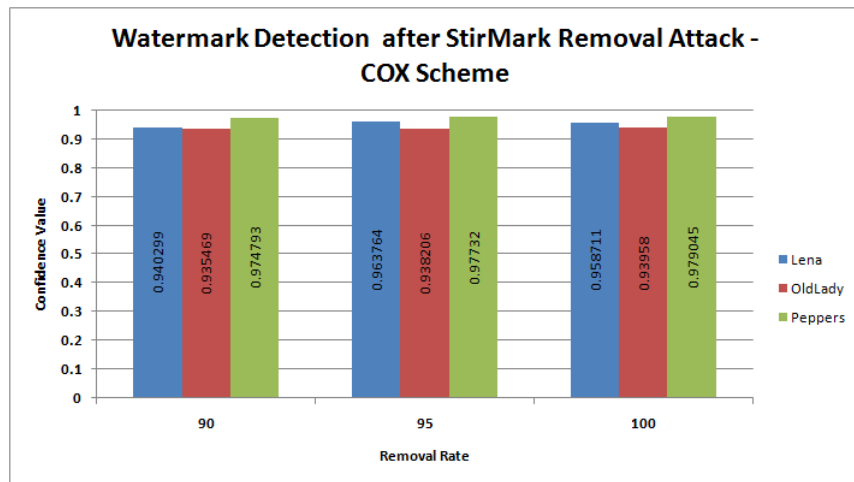


Figure 5.52: Removal Attack:COX Scheme

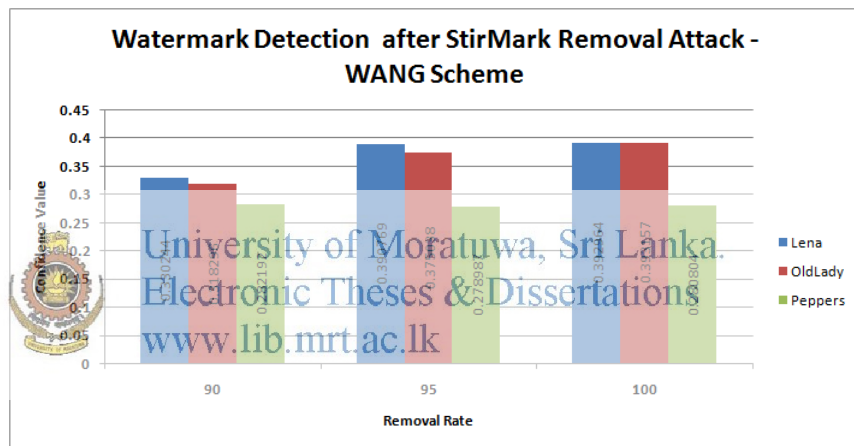


Figure 5.53: Removal Attack:WANG Scheme

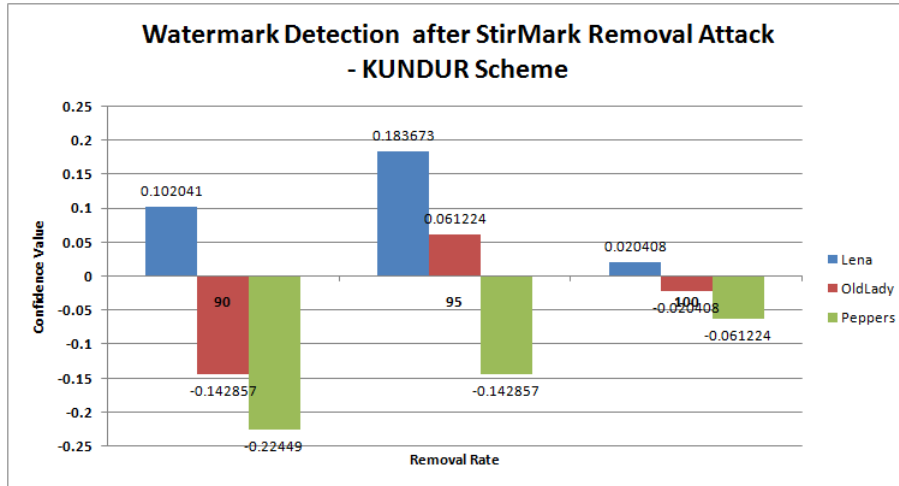


Figure 5.54: Removal Attack:KUNDUR Scheme

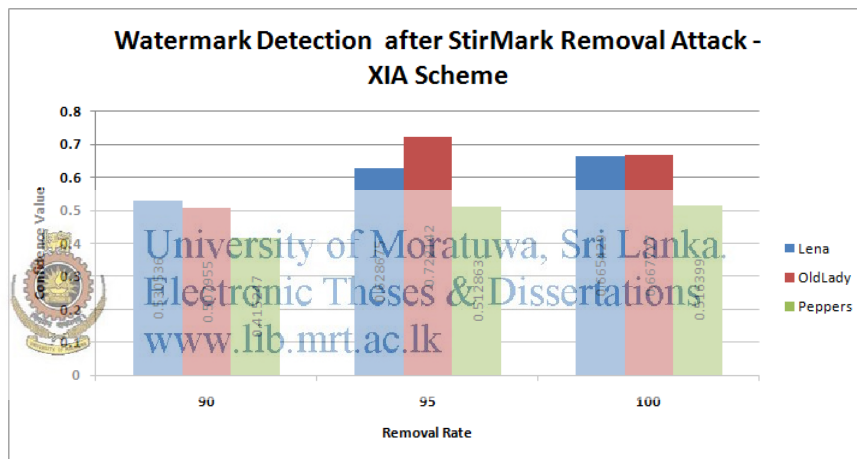


Figure 5.55: Removal Attack:XIA Scheme

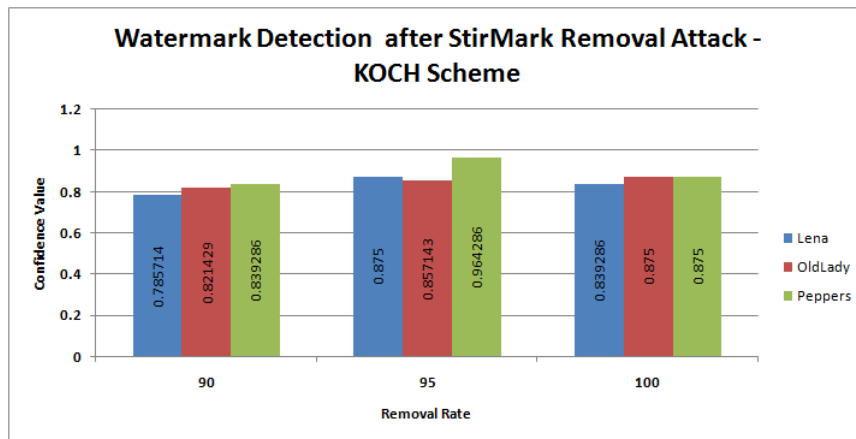


Figure 5.56: Removal Attack:KOCH Scheme

## Appendix F

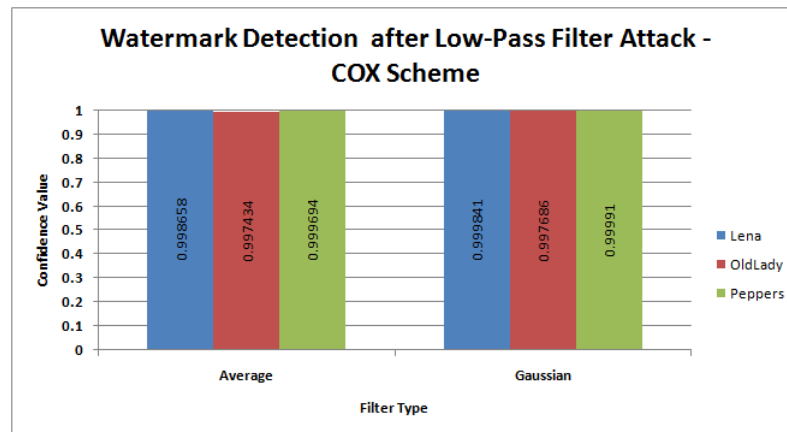


Figure 5.57: Filter Attack:COX Scheme

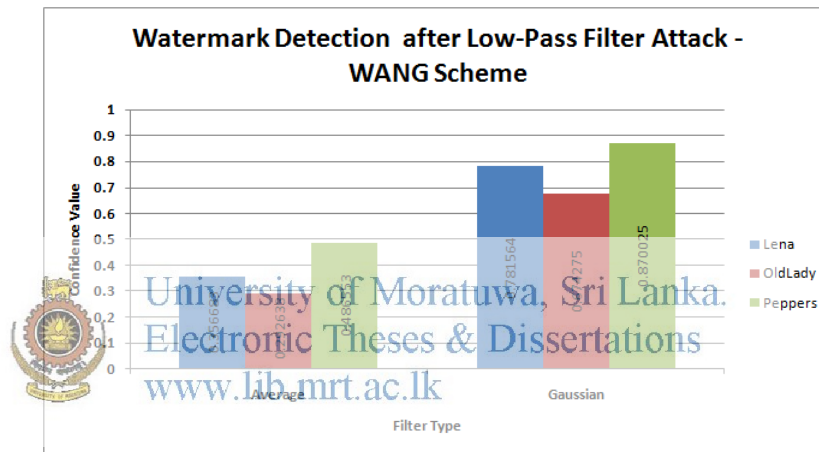


Figure 5.58: Filter Attack:WANG Scheme

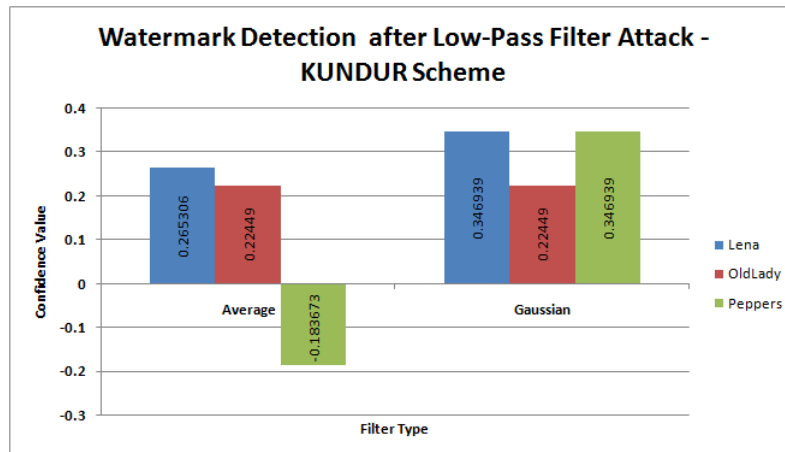


Figure 5.59: Filter Attack:KUNDUR Scheme

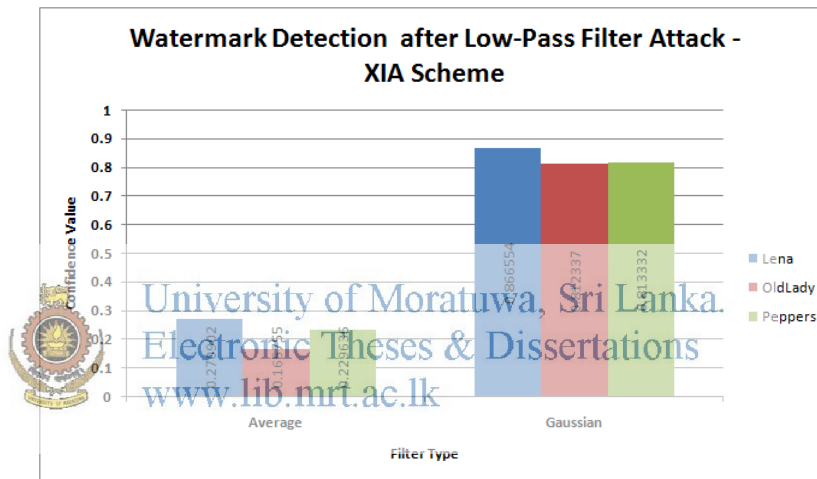


Figure 5.60: Filter Attack:XIA Scheme

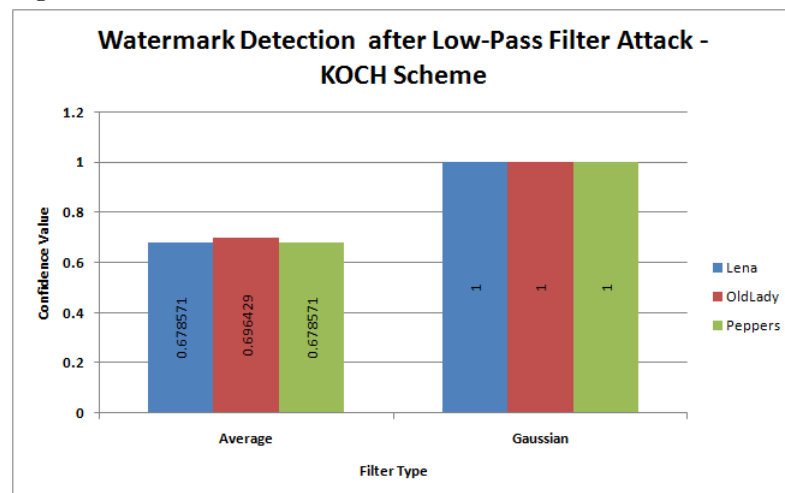


Figure 5.61: Filter Attack:KOCH Scheme



## Appendix G

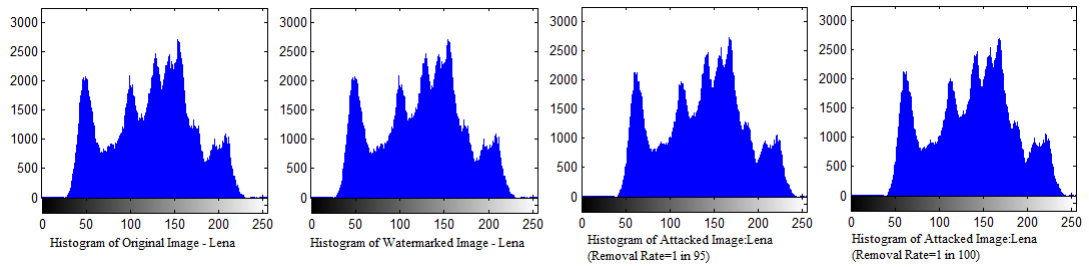


Figure 5.62: Histogram Comparison of Lena:Kundur(StirMark Removal Attack)

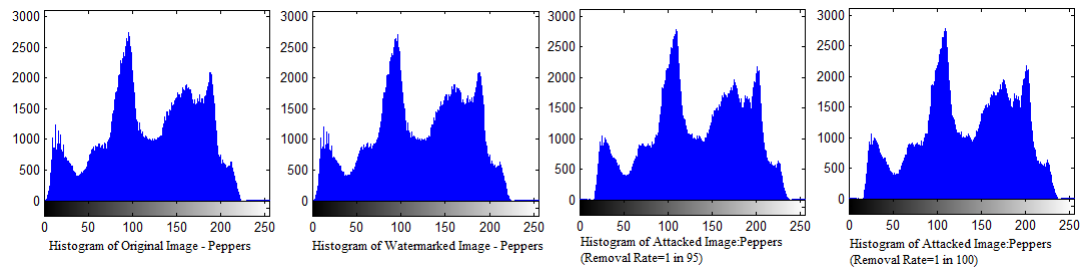


Figure 5.63: Histogram Comparison of Peppers:Kundur(StirMark Removal Attack)

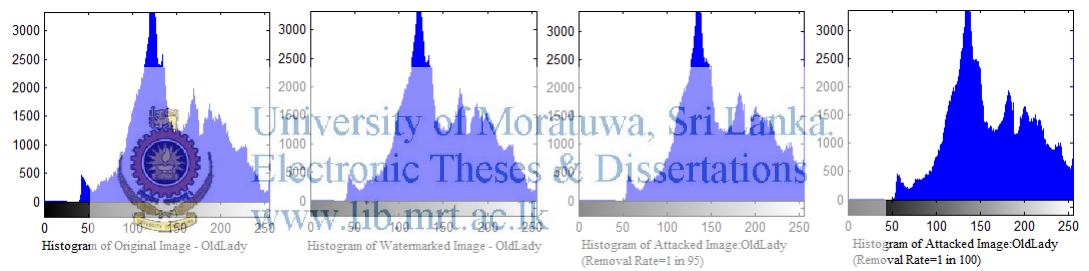


Figure 5.64: Histogram Comparison of OldLady:Kundur(StirMark Removal Attack)

## Appendix H

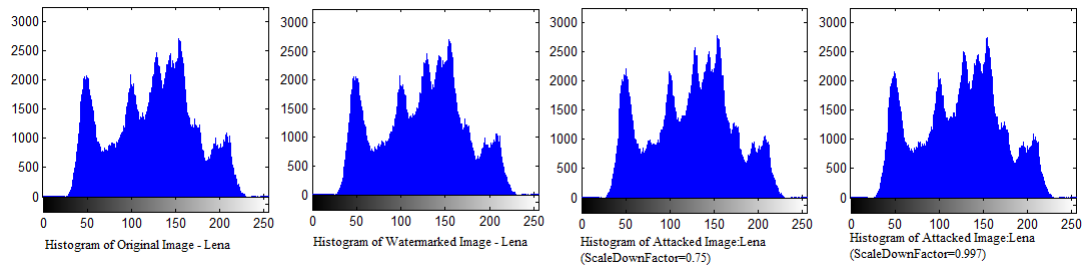


Figure 5.65: Histogram Comparison of Lena:Kundur(Scale Down Attack)

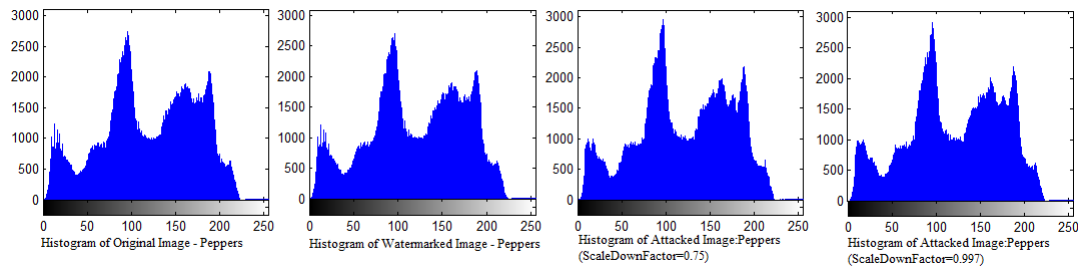


Figure 5.66: Histogram Comparison of Peppers:Kundur(Scale Down Attack)

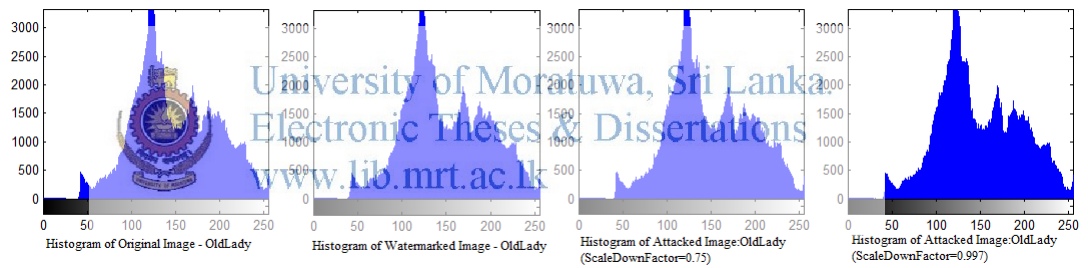


Figure 5.67: Histogram Comparison of OldLady:Kundur(Scale Down Attack)

## Appendix I

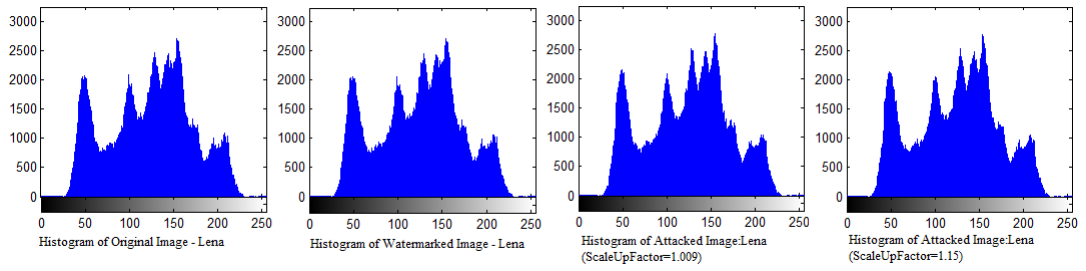


Figure 5.68: Histogram Comparison of Lena:Kundur(Scale Up Attack)

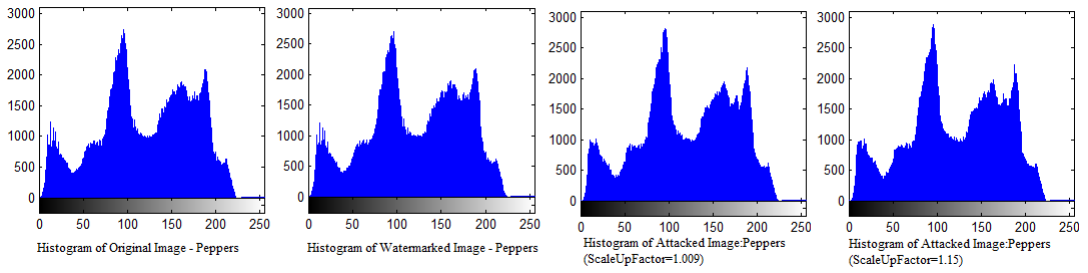


Figure 5.69: Histogram Comparison of Peppers:Kundur(Scale Up Attack)

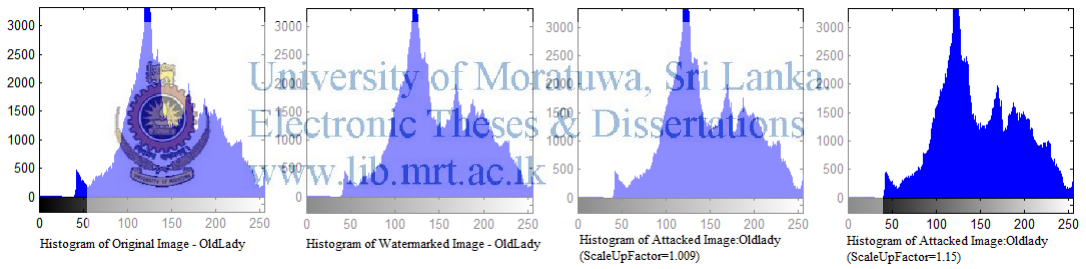


Figure 5.70: Histogram Comparison of OldLady:Kundur(Scale Up Attack)

## Appendix J

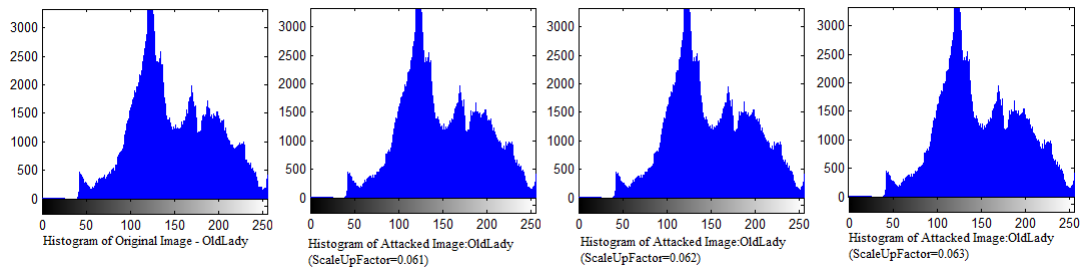


Figure 5.71: Histogram Comparison of Lena:Kundur(Rotate Attack)

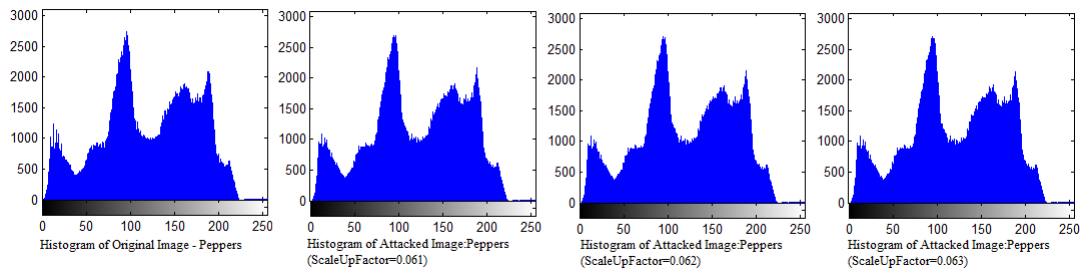


Figure 5.72: Histogram Comparison of Peppers:Kundur(Rotate Attack)

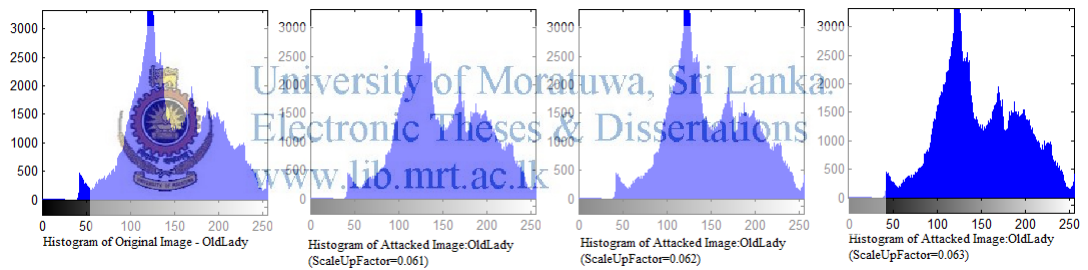


Figure 5.73: Histogram Comparison of OldLady:Kundur(Rotate Attack)

## Appendix K

- Analysis of Flip Attack Results: All watermarking schemes were failed to detect the watermark

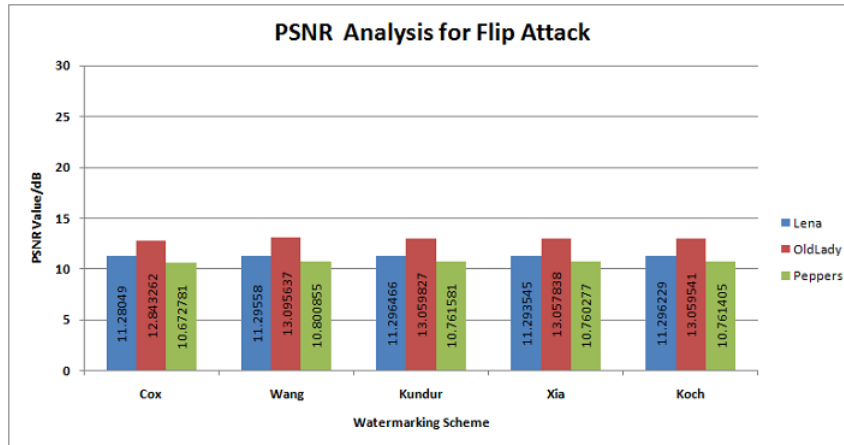


Figure 5.74: PSNR Comparison(Flip Attack)

- Analysis of JPEGCompression Attack:KUNDUR Scheme is failed to detect the watermark (JPEG Qulaity=80,90)

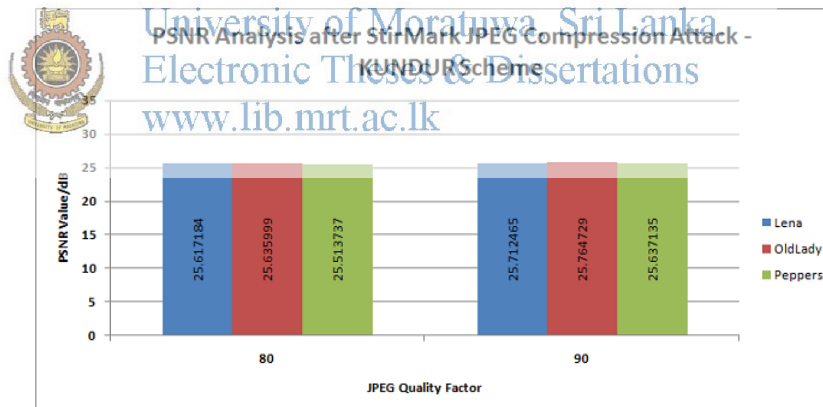


Figure 5.75: PSNR Comparison:Kundur(JPEG Attack)

- Analysis of FilterAttack Results: XIA and KUNDUR Schemes were failed to detect the watermark (Filter Type=Average)

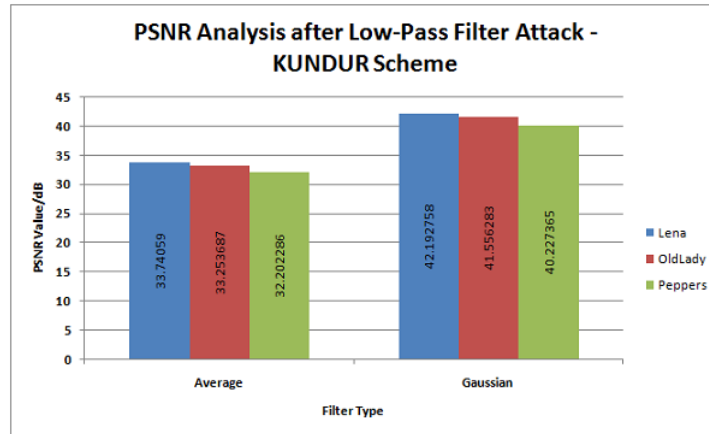


Figure 5.76: PSNR Comparison:Kundur(Filter Attack)

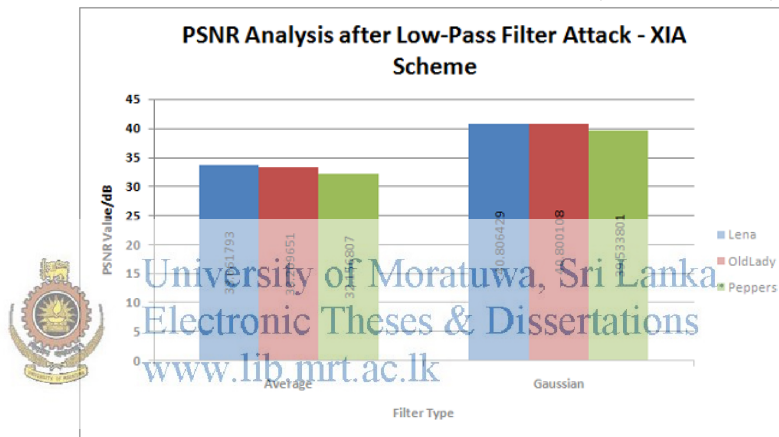


Figure 5.77: PSNR Comparison:Xia(Filter Attack)

- Analysis of Noise Attack-KUNDUR Scheme is failed to detect the watermark

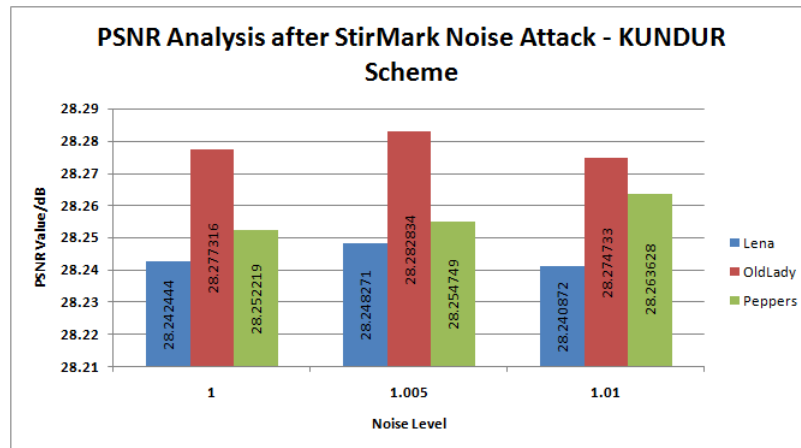


Figure 5.78: PSNR Comparison:Kundur(Noise Attack)

- Analysis of Removal Attack-KUNDUR Scheme is failed to detect the watermark

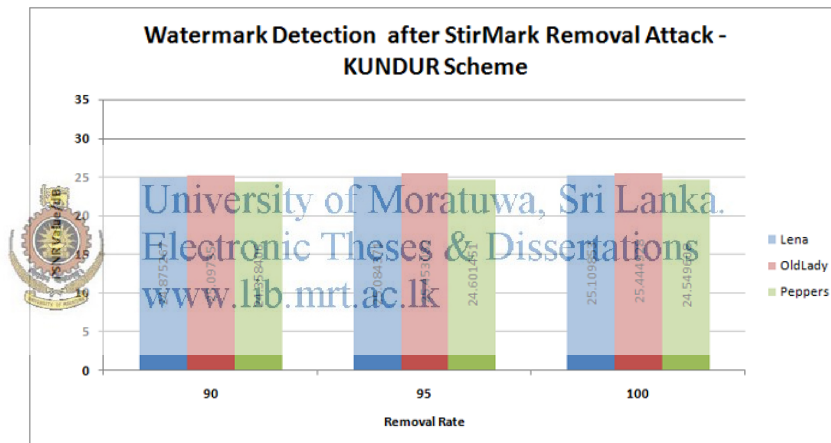


Figure 5.79: PSNR Comparison:Kundur(Removal Attack)



- Analysis of Resize ScaleDown/ScaleUp Attack-KUNDUR Scheme is failed to detect the watermark on certain scale factors

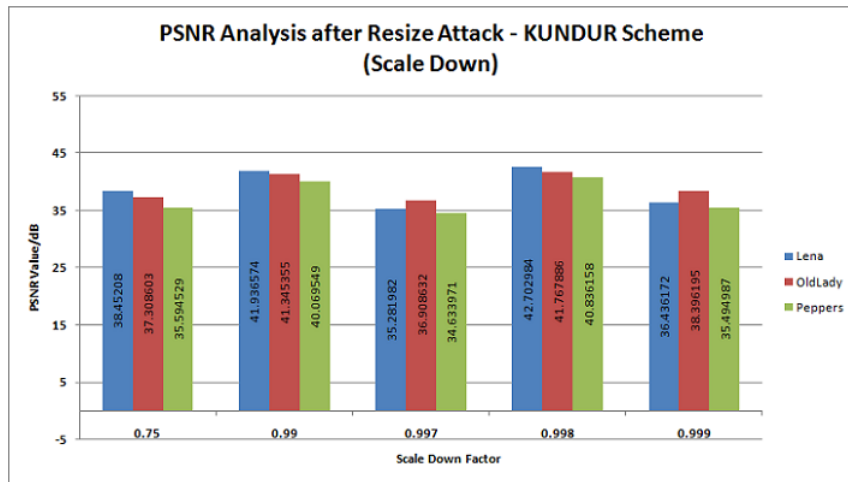


Figure 5.80: PSNR Comparison:Kundur(Scale Down Attack)

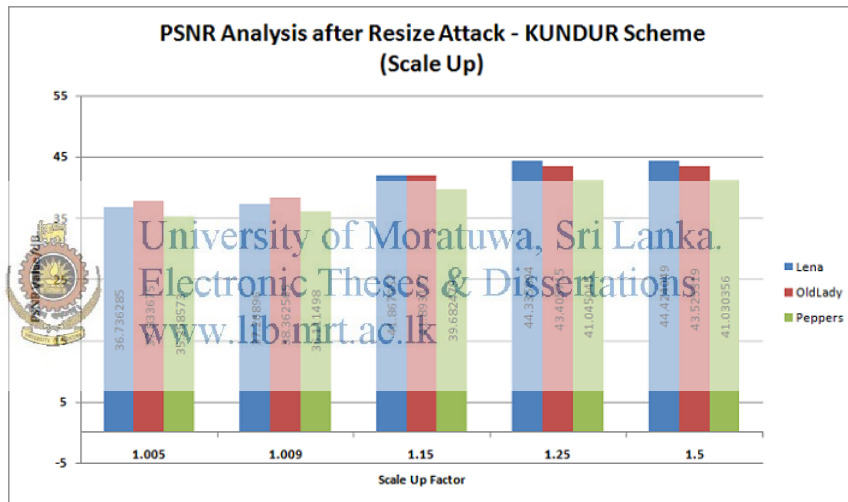


Figure 5.81: PSNR Comparison:Kundur(Scale Up Attack)

- Analysis of Rotate Attack: KUNDUR Scheme is failed to detect the watermark on certain rotation angles (Method:Bicubic)

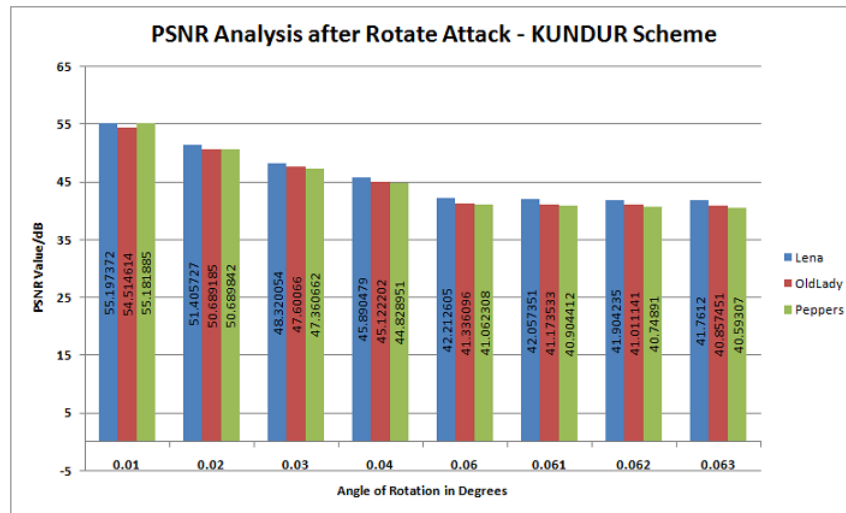


Figure 5.82: PSNR Comparison:Kundur(Rotate Attack)



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