

**INVESTIGATION AND DEVELOPMENT OF
FORENSIC MEAN-BASED ADAPTIVE
BACKGROUND CORRECTION ALGORITHM
(mABCA) FOR VISUAL ENHANCEMENT OF
BLOODSTAINS, SEMINAL STAINS AND
FINGERPRINTS**

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UNIVERSITI SAINS MALAYSIA

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FINGERPRINTS**

by

LEE WEE CHUEN

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LIST OF ABBREVIATIONS

AOTF	Acousto-optic Tunable Filter
AP	Acid Phosphatase
BCA	Background Correction Algorithm
CCD	Charged-Couple Device
CIE	International Commission on Illumination
DFO	1,8-Diazafluoren-9-One
DFT	Discrete Fourier Transform
DNA	Deoxyribonucleic Acid
DSLR	Digital Single-Lens Reflex
EDSDK	EOS Digital Software Development Kit
EF-S	Electrofocus-Short back focus
EMD	Earth Mover's Distance
EOS	Electro-Optical System
Eu(tta) ₃ (phen)	tris(thenoyltrifluoroacetato)(1,10-phenanthroline)europium
FLS	Forensic Light Sources
GLCM	Grey Level Co-occurrence Matrix
Hb	Haemoglobin
HDPE	High-Density Polyethylene
HDR	High Dynamic Range
HDTV	High-Definition Television
HE	Histogram Equalisation
HID	Human Interface Devices
HS	Histogram Stretching

HSI	Hue, Saturation, Intensity
HSV	Hue, Saturation, Value
HUSM	Hospital Universiti Sains Malaysia
FWHM	Full-Width at Half Maximum
IFRG	International Fingerprints Research Group
IR	Infrared
ISO	International Standards Organisation
ITU-R	International Telecommunication Union – Radiocommunication Sector
LCTF	Liquid Crystal Tunable Filter
LED	Light Emitting Diode
LHS	Luminance, Hue, Saturation
LMG	Leucomalachite Green
LTE	Long Term Evolution
mABCA	mean-based Adaptive Background Correction Algorithm
mABCA-DFO1	2-wavelength mABCA for DFO treated latent fingerprints using 580 nm with 550 nm filters images (under 505 nm light)
mABCA-DFO2	2-wavelength mABCA for DFO treated latent fingerprints using 580 nm with 630 nm filters images (under 505 nm light)
mABCA-DFO3	3-wavelength mABCA for DFO treated latent fingerprints using 580 nm with 550 and 630 nm filters images (under 505 nm light)
mABCA-DFO4	2-wavelength mABCA for DFO treated latent fingerprints using orange filter with no filter images (under 505 nm light)
mABCA-DFO5	2-wavelength mABCA for DFO treated latent fingerprints using red filter with no filter images (under 505 nm light)
mABCA-DFO6	2-wavelength mABCA for DFO treated latent fingerprints using 600 nm with 570 nm filters images (under 530 nm light)

mABCA-DFO7	2-wavelength mABCA for DFO treated latent fingerprints using 600 nm with 660 nm filters images (under 530 nm light)
mABCA-DFO8	3-wavelength mABCA for DFO treated latent fingerprints using 600 nm with 570 and 660 nm filters images (under 530 nm light)
mABCA-DFO9	2-wavelength mABCA for DFO treated latent fingerprints using red filter with no filter images (under 530 nm light)
mABCA-ninhydrin1	2-wavelength mABCA for ninhydrin treated latent fingerprints using 415 nm with 458 nm filters images (under white light)
mABCA-ninhydrin2	2-wavelength mABCA for ninhydrin treated latent fingerprints using 500 nm with 470 nm filters images (under white light)
mABCA-ninhydrin3	2-wavelength mABCA for ninhydrin treated latent fingerprints using 580 nm with 630 nm filters images (under white light)
mABCA-ninhydrin4	2-wavelength mABCA for ninhydrin treated latent fingerprints using orange filter with no filter images (under 458 nm light)
mABCA-ninhydrin5	2-wavelength mABCA for ninhydrin treated latent fingerprints using red filter with no filter images (under 458 nm light)
mABCA-ninhydrin6	2-wavelength mABCA for ninhydrin treated latent fingerprints using orange with red filters images (under 458 nm light)
mCA	mean-based Contrast Adjustment
MSE	Mean Square Error
NCD	Normalised Colour Differences
NTSC	National Television System Committee
PAL	Phase Alternating Line
PCA	Principal Component Analysis
PEVA	Polyethylene Vinyl Acetate
PSA	Prostate Specific Antigen
PSNR	Peak Signal to Noise Ratio
PTFE	Polytetrafluoroethylene
PVC	Polyvinyl Chloride

RGB	Red, Green and Blue
ROI	Region Of Interest
SIVV	Spectral Image Validation and Verification
SSIM	Structural Similarity Index Measure
TIFF	Tagged Image File Format
USB	Universal Serial Bus
USM	Ultrasonic Motor
UV	Ultraviolet