

ColorTool: simple, fast, free, effective & diverse for everybody in color calculation

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3. Main mode *“Run what you want”*: to evaluate the color quality of your spectra
4. Mode *“Calculation correlation”*: find 2D & 3D correlations as SPSS
5. Mode *“Calculation Optimization”*: optimize color quality & synthesis PID for regulators
6. Mode *“Calculate Color”*: calculate all color difference, chroma difference, represent correct test color sample with their true color under different light sources
7. Mode *“Generate”*: generate standard spectra, locus of MacAdam-Ellipse, spectra of semiconductor LED and phosphors
8. Mode *“ISD Space”*: read, arrange and save ISD data from spectrometers



1- Motivation

How to evaluate color quality of spectra?

How to evaluate and represent color objects?

How to find correlations like as SPSS?

How to have 1-2..MacAdam-Ellipse for desired CCT or xy?

How to read, arrange & save ISD data from spectrometer?

How to optimize the color quality?

How to generate standard light sources with desired CCTs?

How to generate spectra of semiconductor LEDs?

How to generate spectral emission of phosphors?

I can't work with .csv, but only Excel or txt?

I have no money to buy Matlab/SPSS



2- Installation

you need a MCR Matlab as runtime like Java, .Net & Setup file

~~Microsoft®
.NET~~

~~Java~~

MATLAB®
Component Runtime

MATLAB Compiler

Release	Windows	Linux	Mac
R2016a (9.0.1)	64 Bit	64 Bit	Intel 64 Bit
R2015b (9.0)	32 Bit / 64 Bit	64 Bit	Intel 64 Bit
R2015aSP1 (8.5.1)	32 Bit / 64 Bit	64 Bit	Intel 64 Bit
R2015a (8.5)	32 Bit / 64 Bit	64 Bit	Intel 64 Bit
R2014b (8.4)	32 Bit/64 Bit	64 Bit	Intel 64 Bit
R2014a (8.3)	32 Bit/64 Bit	64 Bit	Intel 64 Bit
R2013b (8.2)	32 Bit/64 Bit	64 Bit	Intel 64 Bit
R2013a (8.1)	32 Bit/64 Bit	64 Bit	Intel 64 Bit
R2012b (8.0)	32 Bit/64 Bit	64 Bit	Intel 64 Bit
R2012a (7.17)	32 Bit/64 Bit	32 Bit/64 Bit	Intel 64 Bit

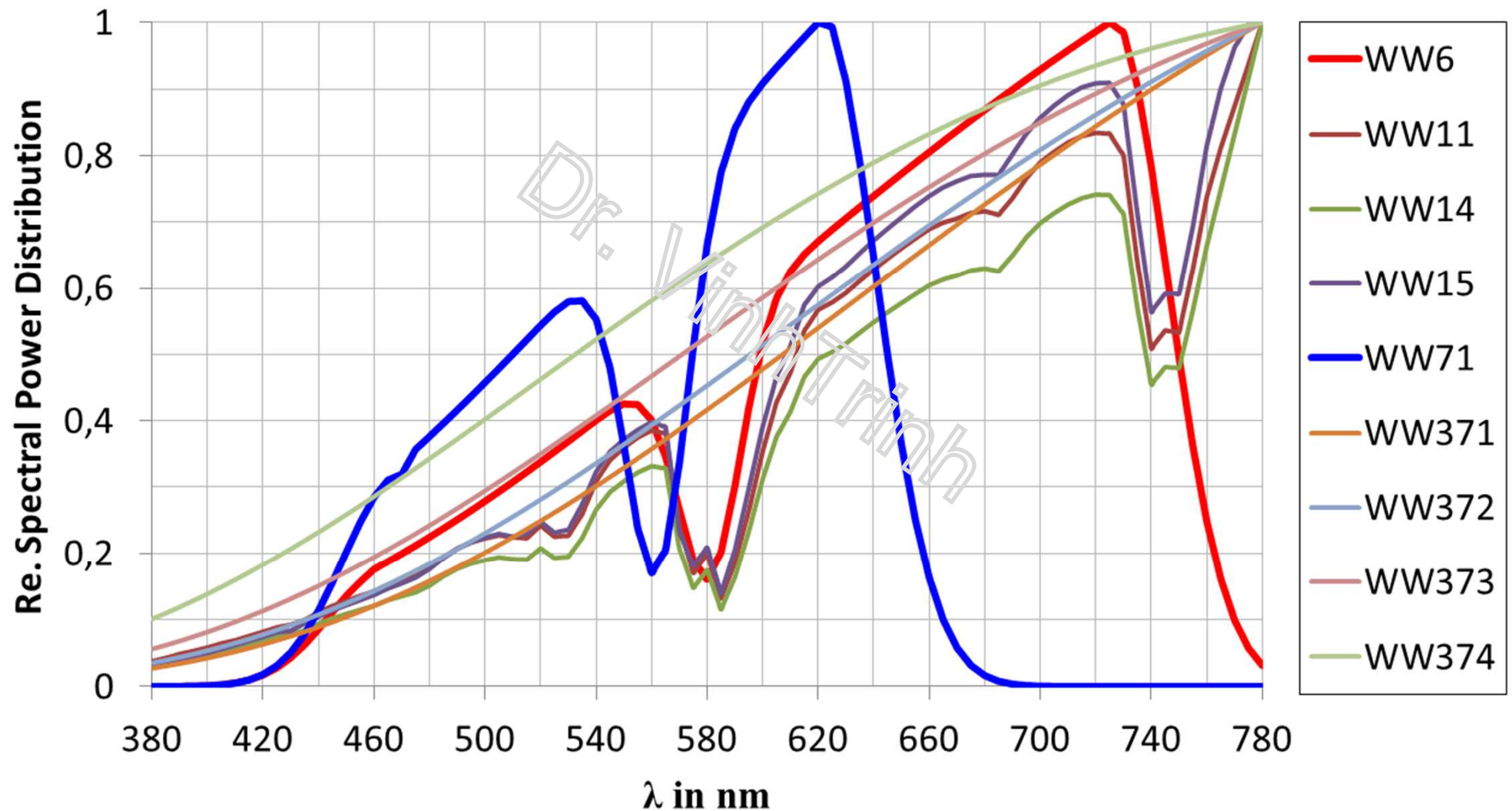
Color Toolbox 2015 - Version 22.9.2015

File Explorer: C:\FGLTData\(\FGLTSAN) (X:) > Büro > VT > ZZZZZ_Released Programs > Color Toolbox 2015 - Version 22.9.2015 >

Name	Änderungsdatum	Typ	Größe
History	07.03.2016 09:25	Dateiordner	
A format sample for csv	21.09.2015 20:19	CSV-Datei	7 KB
A format sample for txt	05.09.2015 05:59	Textdokument	7 KB
A format sample for xls or xlsx	23.09.2015 14:50	Microsoft Excel-Ar...	150 KB
Licht_November_Khanh_Hei	13.11.2015 14:02	Foxit Reader PDF ...	1.356 KB
MCR_R2015b_win64_installer	18.02.2016 17:15	Anwendung	806.979 KB
Password - LichtAn	23.09.2015 14:43	Textdokument	1 KB
readme	23.09.2015 10:14	Textdokument	2 KB
setup for color tool V07-03-2016	07.03.2016 09:34	Anwendung	5.995 KB

3- Main Mode “*Run what you want*”

Import, analysis & evaluate your spectra



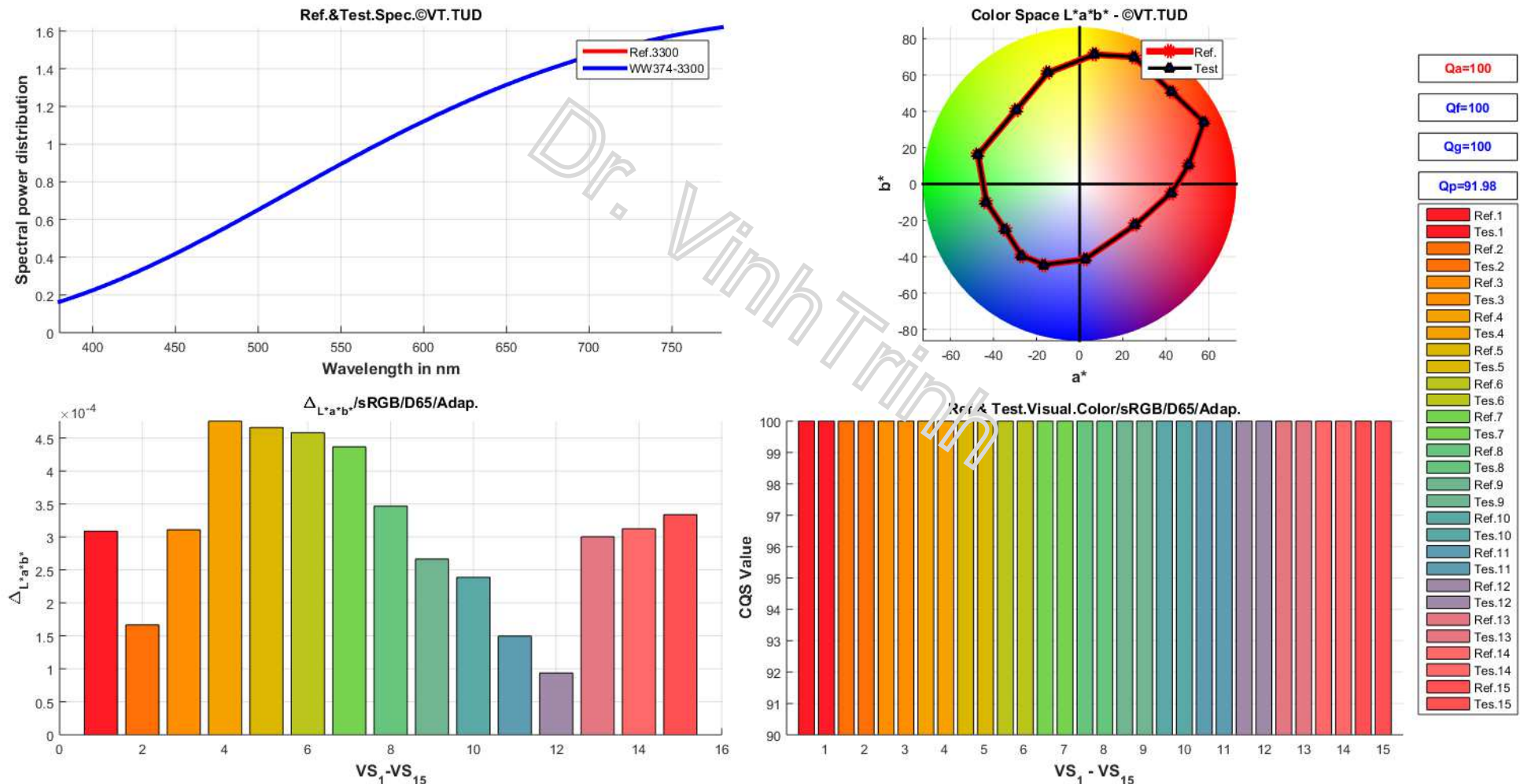
3- Main Mode “Run what you want”

Import, analysis & evaluate your spectra

Name	WW6	WW11	WW14	WW15	WW71	WW371	WW372	WW373	WW374
CCT	2887	2869	2826	2756	3003	2700	2800	3000	3300
DCCT	2,60E-04	5,28E-03	5,45E-03	4,82E-03	3,58E-05	2,91E-06	2,81E-06	2,64E-06	2,42E-06
R1	68,13	70,68	70,74	70,67	88,96	100	100	100	100
R2	85,45	87,19	87,06	86,94	86,24	100	100	100	100
R3	88,81	87,16	87,42	87,29	81,49	100	100	100	100
R4	67,62	71,95	71,92	71,44	85,29	100	100	100	100
R5	71,27	74,03	73,82	73,69	84,34	100	100	100	100
R6	81,50	86,66	86,35	85,85	68,81	100	100	100	100
R7	82,50	81,54	81,97	82,48	80,46	100	100	100	100
R8	59,47	54,86	55,64	57,07	73,27	100	100	100	100
R9	21,29	9,65	11,54	15,47	46,95	100	100	100	100
R10	74,22	78,93	78,69	78,71	67,56	100	100	100	100
R11	63,50	72,50	72,28	71,25	70,58	100	100	100	100
R12	76,41	76,34	75,74	75,53	62,09	100	100	100	100
R13	70,45	73,88	73,79	73,46	54,89	100	100	100	100
R14	92,03	91,14	91,29	91,15	90,37	100	100	100	100
Ra	75,59	76,76	76,88	76,93	81,11	100	100	100	100
R114	71,62	72,61	72,74	72,93	76,49	100	100	100	100
GAI_t	58,84	71,02	69,98	66,47	54,42	49,14	52,24	58,07	65,83
GAI_r	50,20	62,39	61,57	58,41	52,21	49,14	52,24	58,07	65,83
GAI_{rel}	117,21	113,83	113,66	113,80	104,23	100	100	100	100
Qa	84,58	89,80	89,94	89,74	83,41	100	100	100	100
Qf	80,11	83,20	83,32	83,46	82,15	100	100	100	100
Qg	106,92	114,10	114,32	113,89	93,93	100	100	100	100
Qp	89,79	102,25	102,53	101,89	73,05	87,83	88,78	90,33	91,98
CRI2012a	87,26	91,26	91,40	91,55	79,09	100,00	100,00	100,00	100,00
Se2012	2,00	1,74	1,73	1,72	2,46	1,07	1,07	1,07	1,07
MCR_{1a}	91,52	93,21	93,10	92,73	86,31	89,26	89,59	90,05	90,45
FCI	142,52	144,82	145,02	145,17	113,20	123,72	122,97	121,37	118,92
R _f	80,98	85,45	85,51	85,56	77,66	100	100	100	100
R_g	103,15	108,78	108,88	108,57	92,66	100	100	100	100

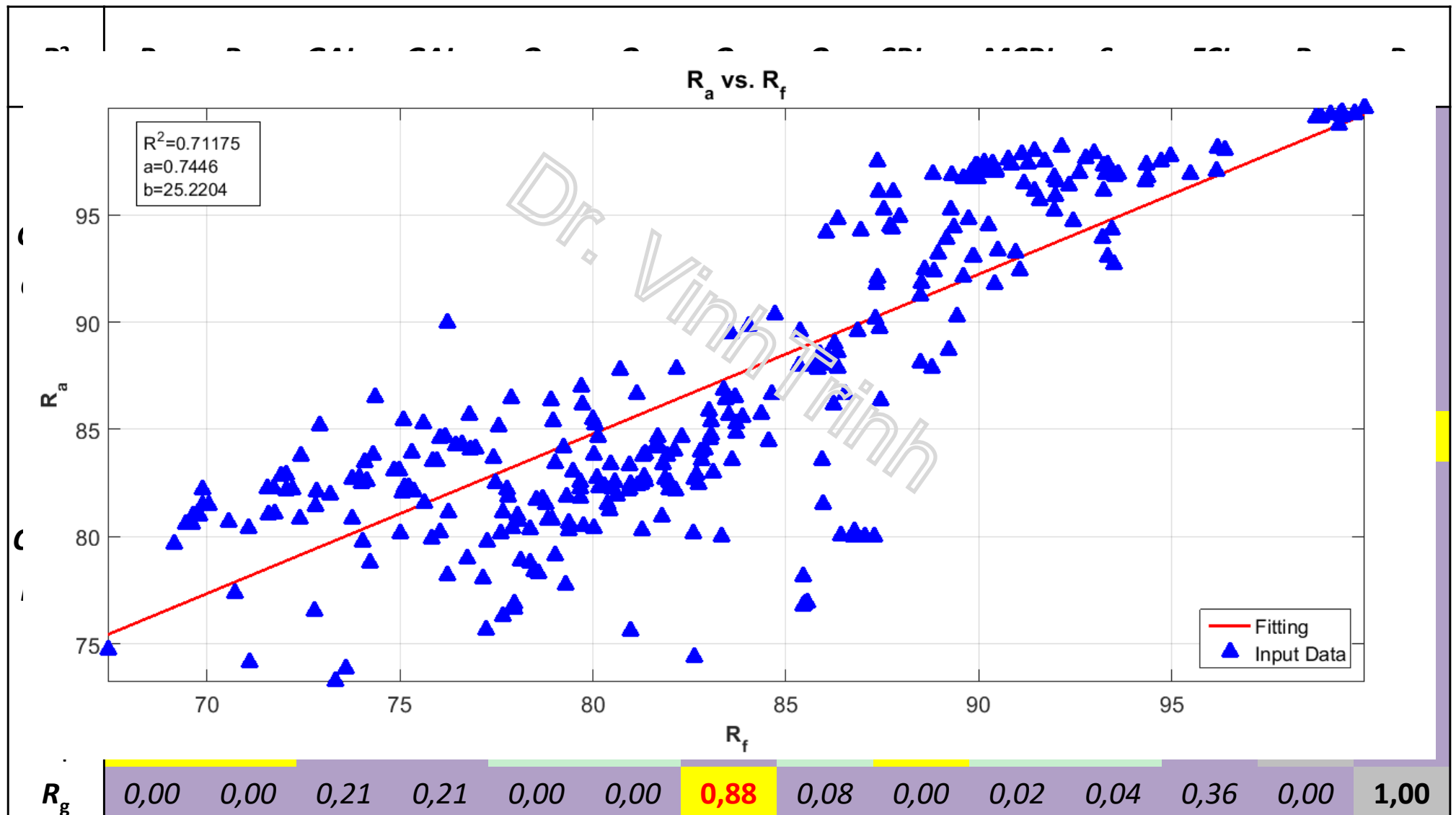
3- Main Mode “Run what you want”

Import, analysis & evaluate your spectra



4- Sub-Mode 1 “Calculation Correlation”

a- 2D - Correlation



4- Sub-Mode 1 “Calculation Correlation”

b- 3D Correlation

$MCRI-R^2$	R_a	R_{114}	Q_f	CRI_{2012}	R_f
GAI_{abs}	0,53	0,69	0,51	0,76	0,78
GAI_{rel}	0,70	0,78	0,50	0,76	0,76
Q_g	0,56	0,72	0,46	0,72	0,72
FCI	0,65	0,78	0,60	0,79	0,79
R_g	0,50	0,67	0,50	0,71	0,71

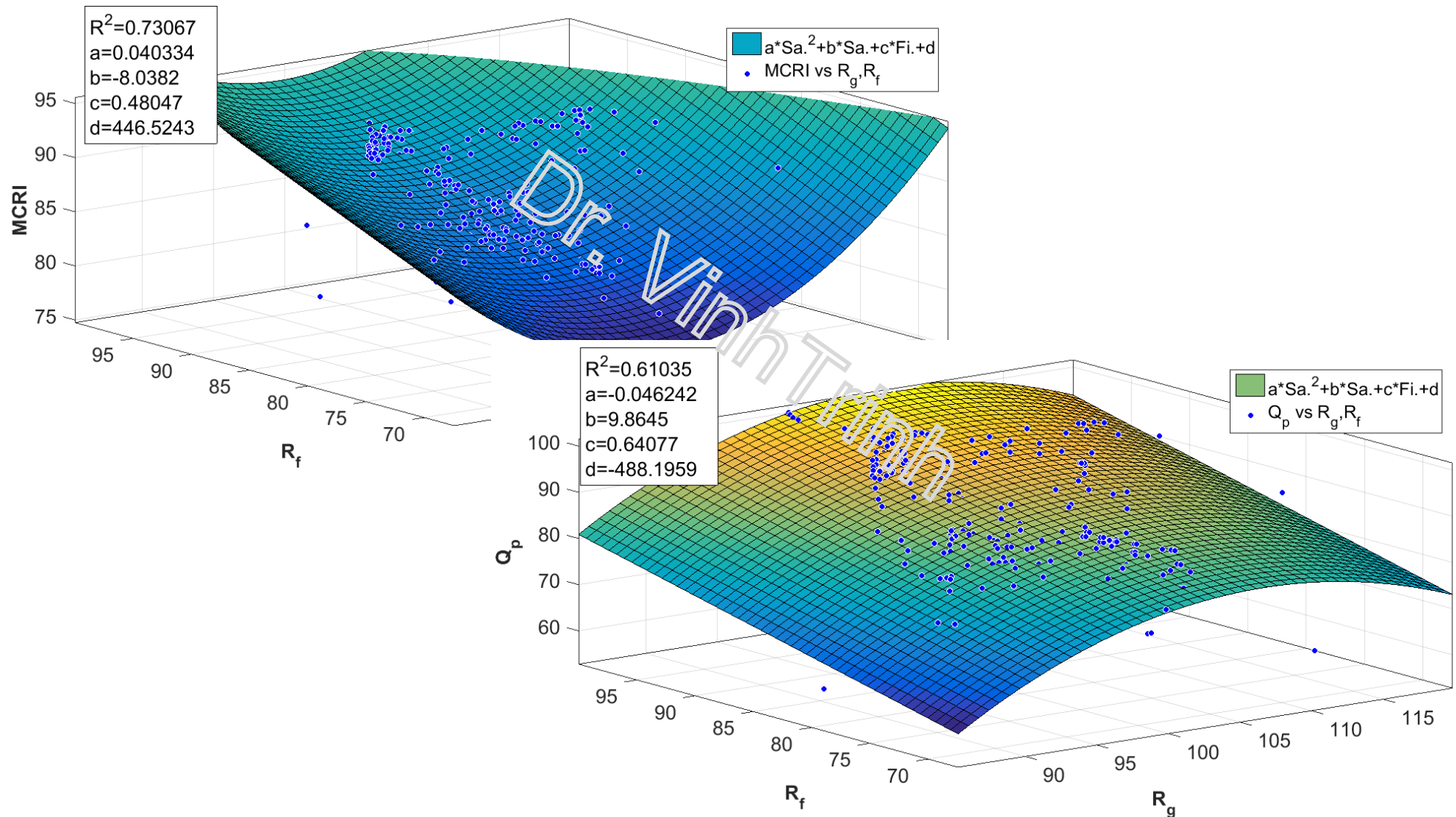
$MCRI-a$	R_a	R_{114}	Q_f	CRI_{2012}	R_f
GAI_{abs}	-1,2E-03	-6,1E-04	6,5E-03	1,7E-05	1,2E-04
GAI_{rel}	4,4E-02	3,1E-02	1,0E-02	7,6E-03	1,6E-02
Q_g	4,7E-02	3,8E-02	3,7E-02	1,7E-02	2,4E-02
FCI	8,8E-03	8,9E-03	1,3E-03	2,2E-03	3,8E-03
R_g	5,5E-02	4,7E-02	6,8E-02	3,6E-02	4,0E-02

Q_p-R^2	R_a	R_{114}	Q_f	CRI_{2012}	R_f
GAI_{abs}	0,54	0,58	0,86	0,58	0,66
GAI_{rel}	0,49	0,49	0,94	0,54	0,57
Q_g	0,44	0,50	0,97	0,57	0,62
FCI	0,47	0,48	0,96	0,49	0,55
R_g	0,43	0,51	0,95	0,52	0,52

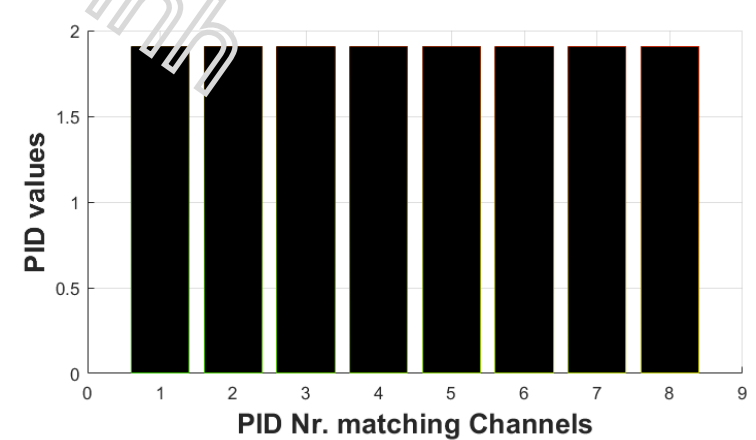
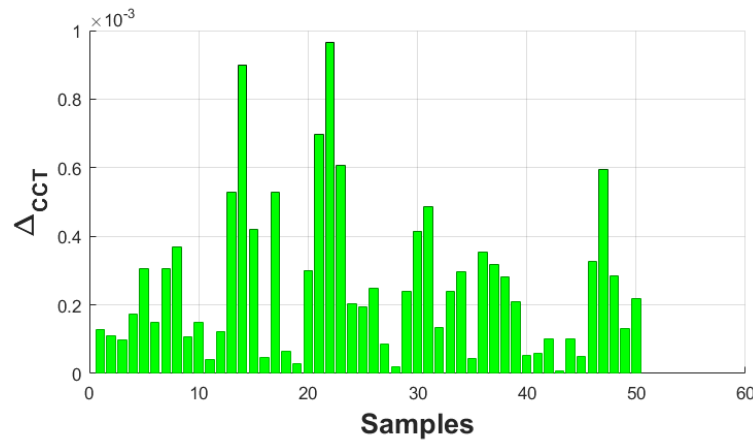
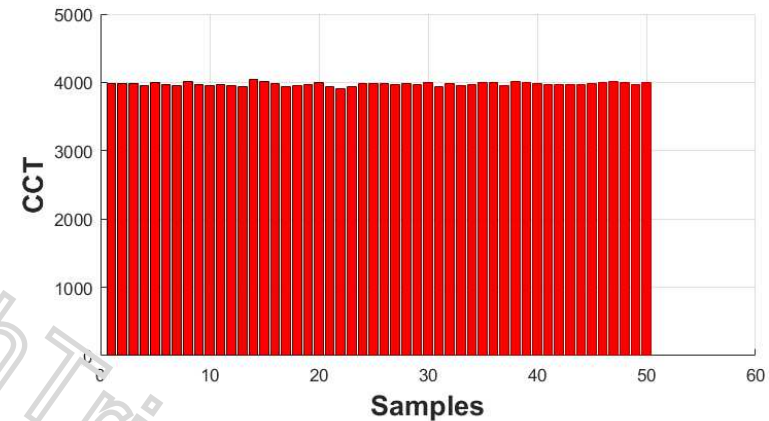
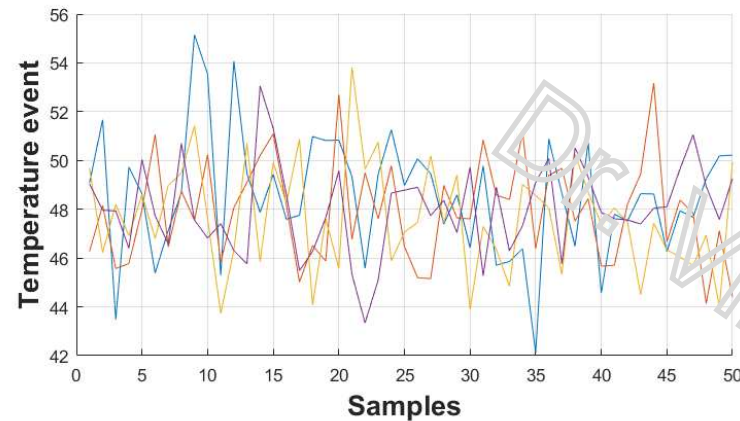
Q_p-a	R_a	R_{114}	Q_f	CRI_{2012}	R_f
GAI_{abs}	-1,8E-02	-1,7E-02	1,9E-03	-1,7E-02	-1,6E-02
GAI_{rel}	2,8E-02	1,2E-02	4,8E-03	-1,1E-02	-2,3E-04
Q_g	-1,9E-03	-1,3E-02	8,5E-03	-3,8E-02	-2,8E-02
FCI	6,2E-03	3,7E-03	1,9E-03	-3,7E-03	-7,8E-04
R_g	-2,7E-02	-3,9E-02	2,0E-02	-5,2E-02	-4,6E-02

4- Sub-Mode 1 “Calculation Correlation”

b- 3D Correlation

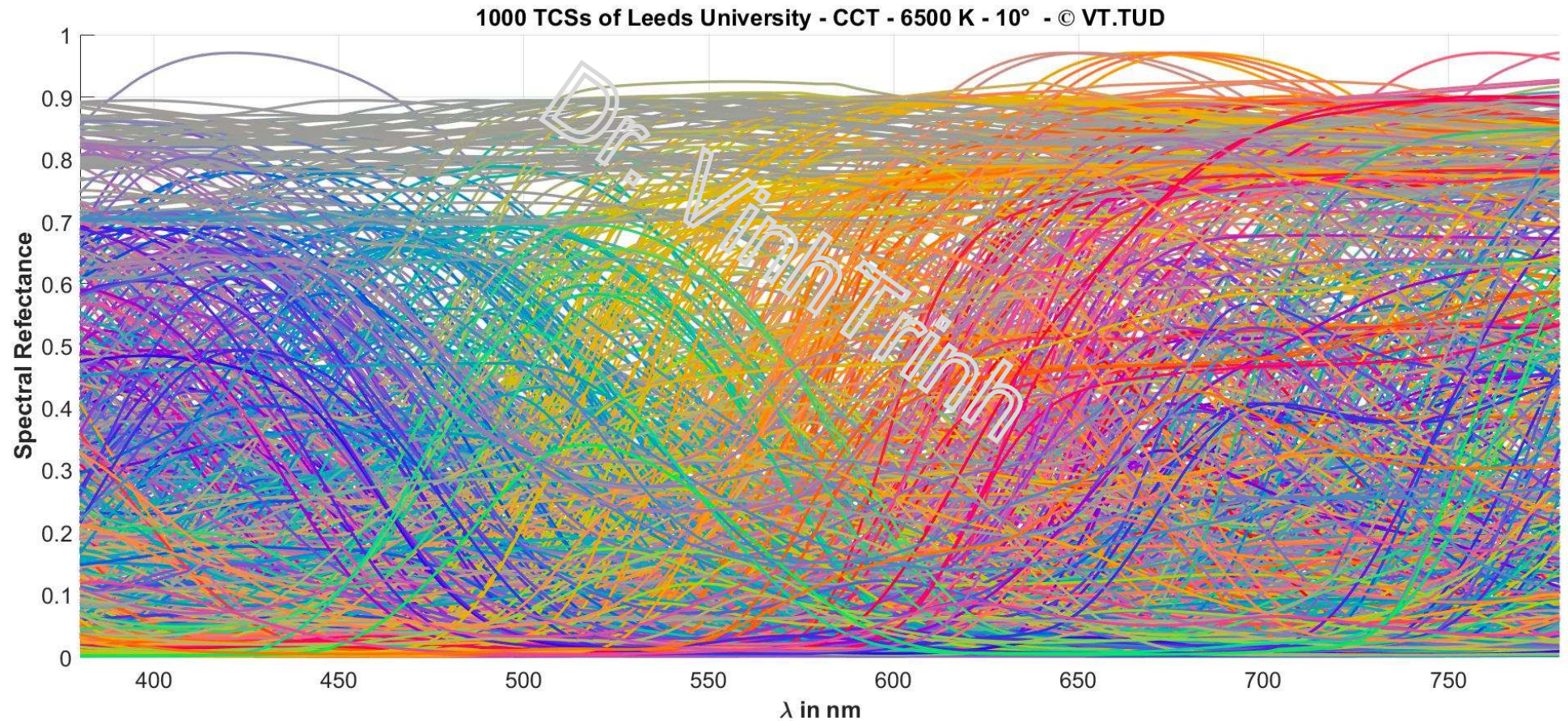


5- Sub-Mode 2 “Calculate Optimization”



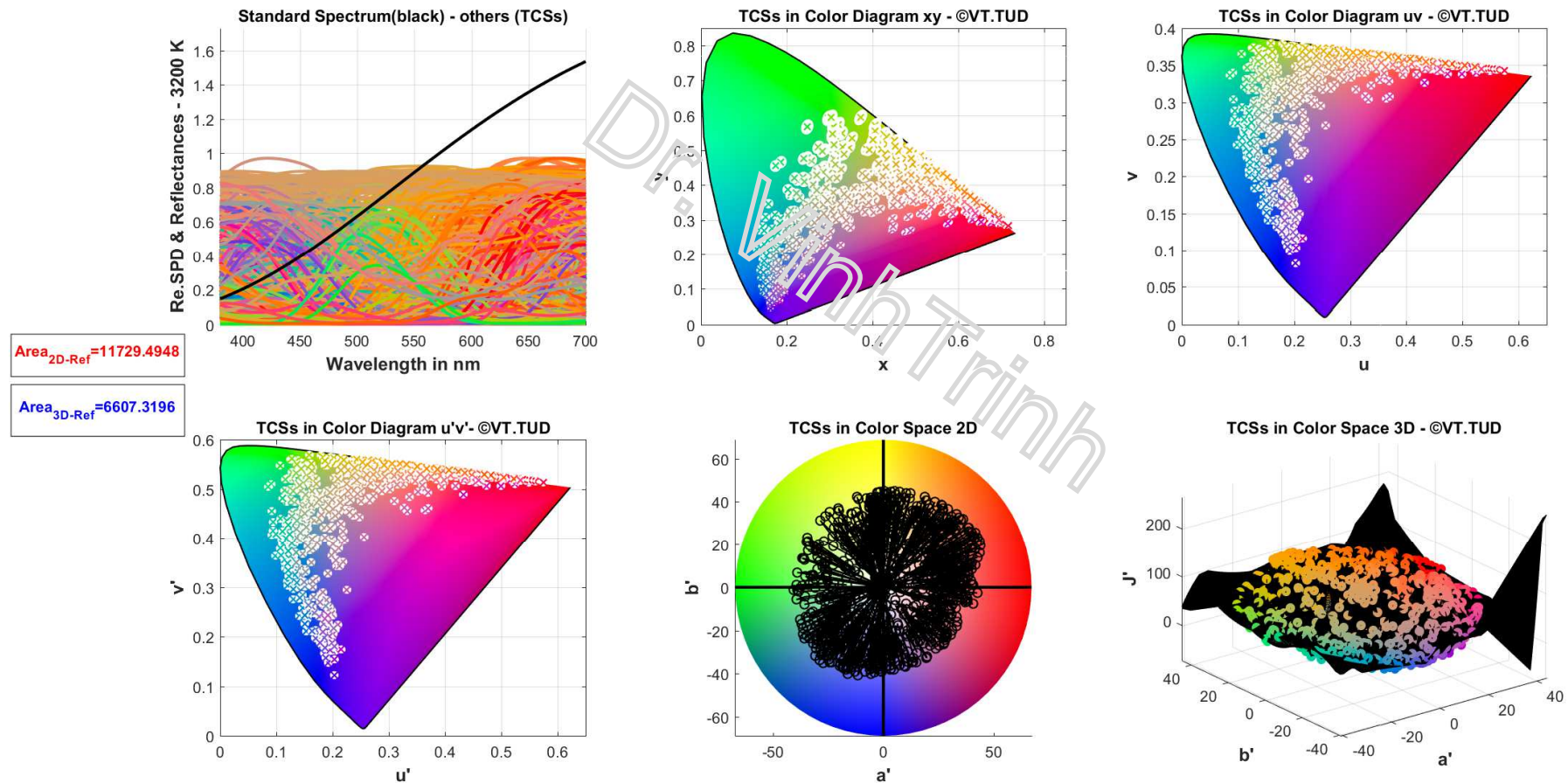
6- Sub-Mode 4 “Calculate Color”

α - Import TCSs & represent with their true colors



6- Sub-Mode 4 “Calculate Color”

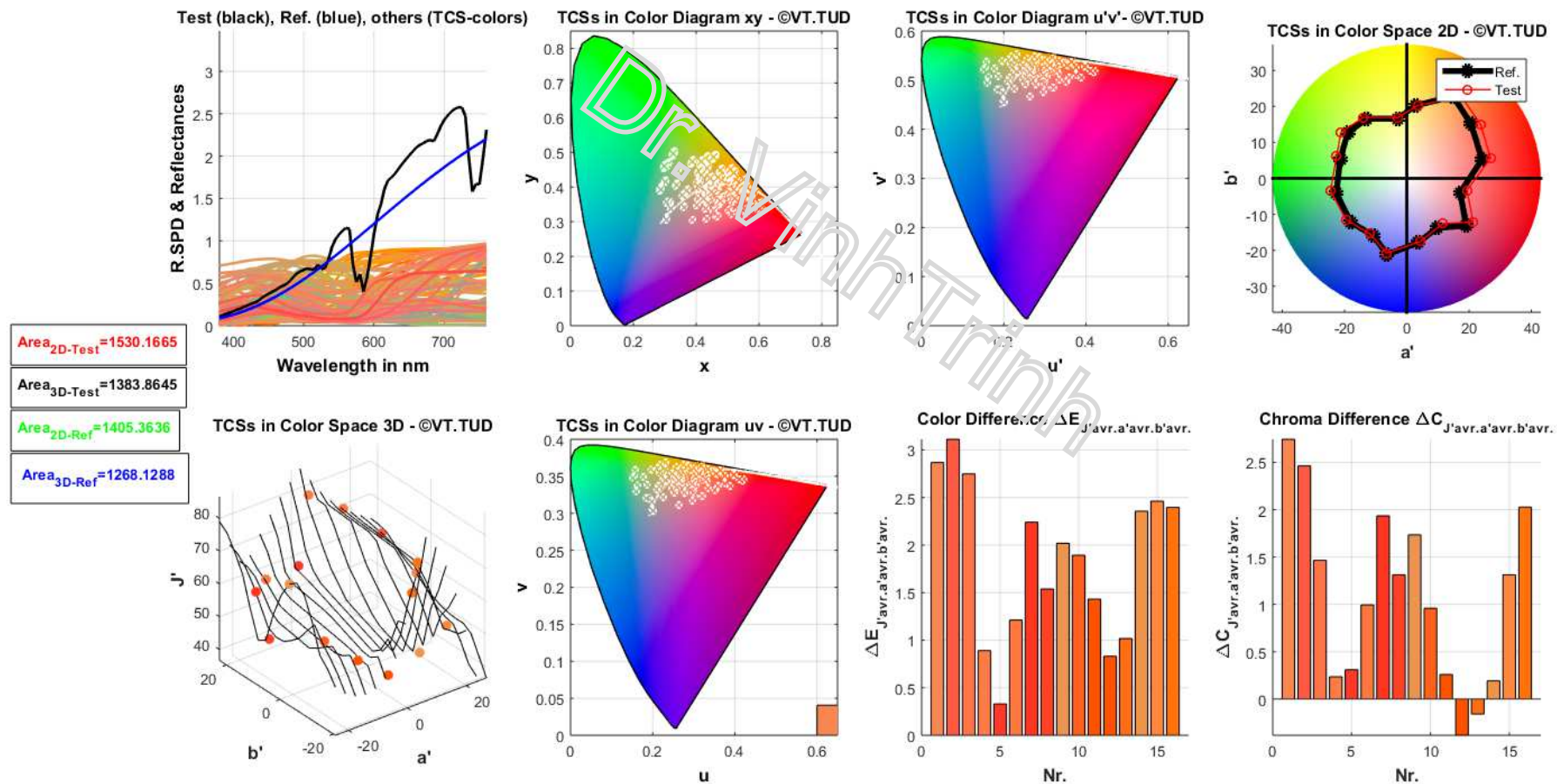
b- Color Distribution in 2D - 3D Color diagram under different CCTs



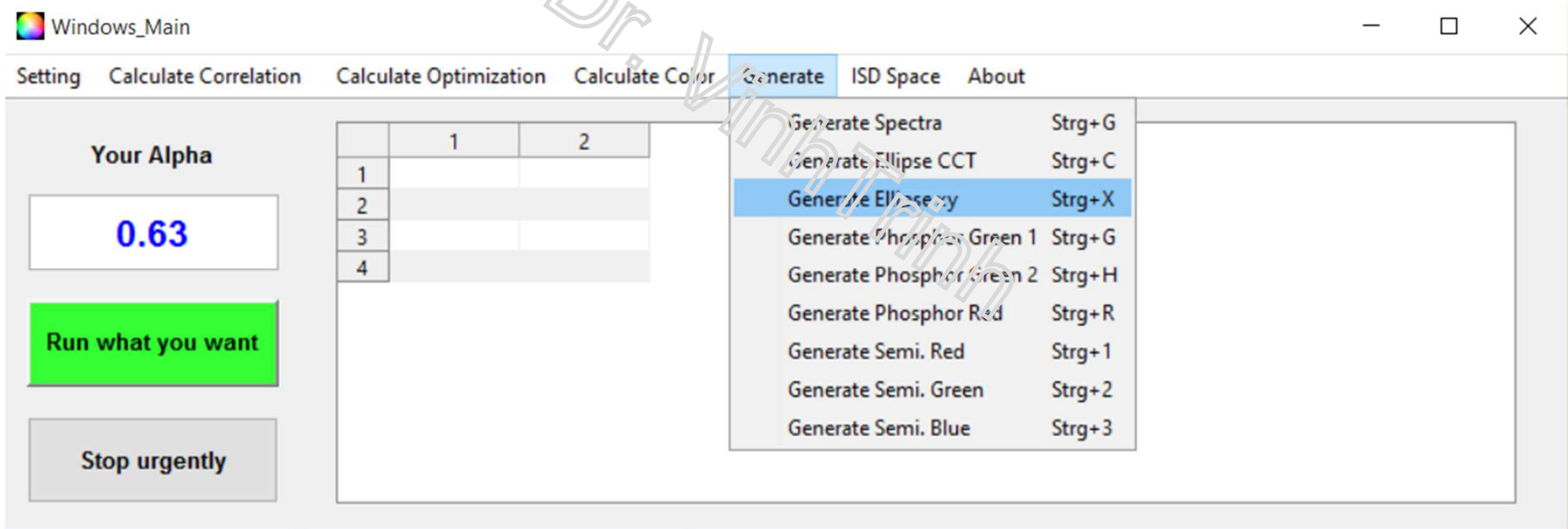
6- Sub-Mode 4 “Calculate Color”

c- Calculate & represent hue & chroma difference under color spaces

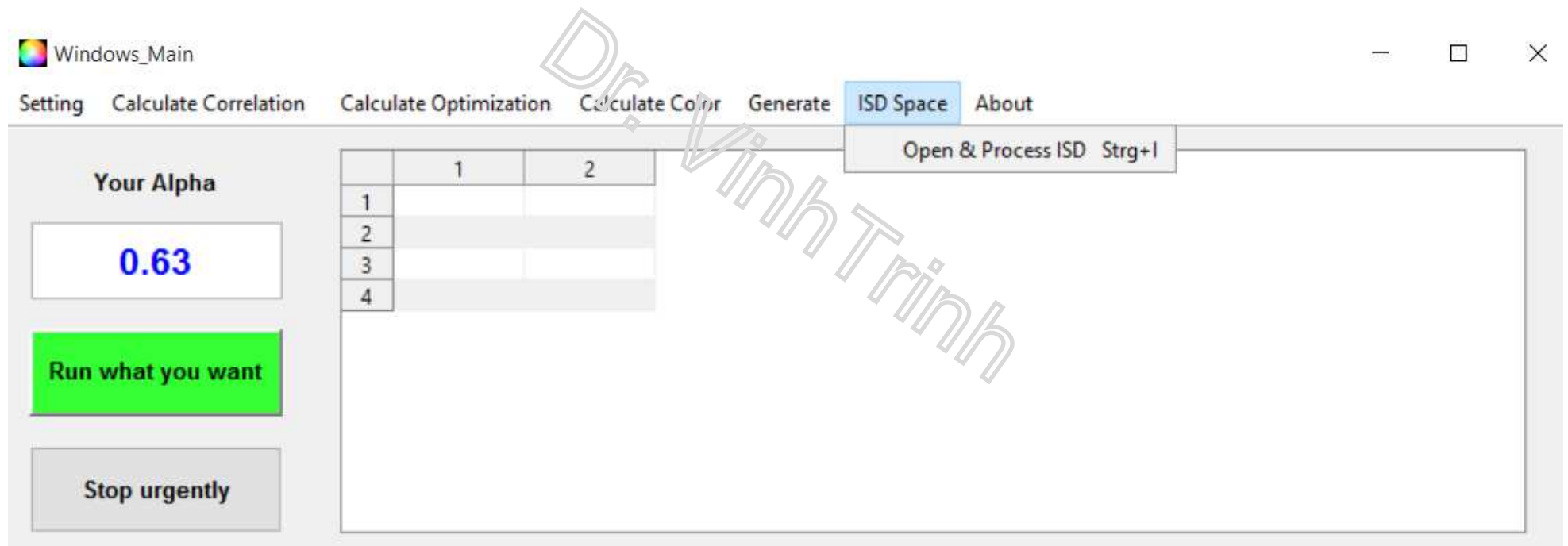
Color Space Lab for Resolution 1301 Bin 1-16



7- Sub-Mode 4 “Generate”



8- Sub-Mode 5 “ISD Space”



Thanks for your attention!