



TWC/31/29

ORIGINAL: English

DATE: May 13, 2013

INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

Geneva

TECHNICAL WORKING PARTY ON AUTOMATION AND COMPUTER PROGRAMS**Thirty-First Session
Seoul, Republic of Korea, June 4 to 7, 2013**

AIM: MANAGEMENT OF COLOR ANALYSIS

Document prepared by experts from France

1. The Technical Committee (TC), at its forty-ninth session, held in Geneva, from March 18 to 20, 2013, agreed with the recommendation of the Technical Working Party on Automation and Computer Programs (TWC) concerning the inclusion of the AIM software from France in document UPOV/INF/16, as set out in paragraph 19 of document TC/49/12 "Exchangeable software" (see document TC/49/41 "Report on the conclusions", paragraph 107).
2. The CAJ, at its sixty-seventh session, held in Geneva, on March 21, 2013, noted that it would be invited, at its sixty-eighth session, to be held in Geneva in October 2013, to consider a proposed revision of document UPOV/INF/16 "Exchangeable Software" (see document CAJ/67/14 "Report on the conclusions", paragraph 56).
3. The Annex to this document contains a copy of a presentation on AIM software that will be made to the TWC, at its thirty-first session, in order to provide further information concerning the use of the AIM software, for color analysis in France.
4. *The TWC is invited to note the information contained in Annex to this document.*

[Annex follows]

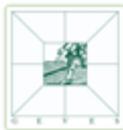


AIM

Management of Color Analysis

Experience from France

June 4 to June 7, 2013 (Seoul, South Korea)



PROGRAM OF THE TALK

- GENERAL ARCHITECTURE OF AIM APPLICATION
- GENERAL PROCESS OF COLOR ANALYSIS
- DETAIL OF THE COLOR ANALYSIS PROCESS
- DEMONSTRATION THROUGH AN SIMPLE EXAMPLE



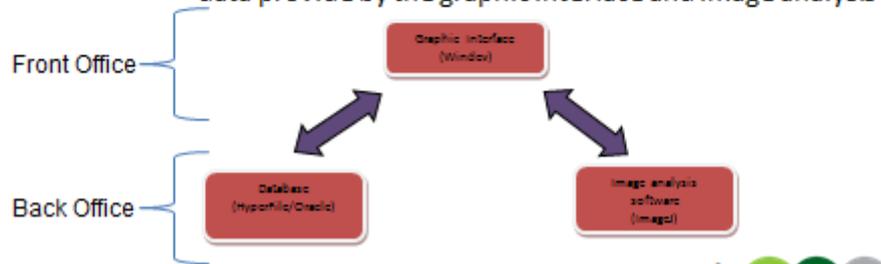
GENERAL ARCHITECTURE

The Aim application is based on the following architecture

A front office → Graphic Interface written with the development tool Windev to manage studies (Declare, Retrieve, Export, Calculate, Levels of aggregation, ...)

A back office → Image analysis software with the freeware ImageJ to define processing applied on images

Database software with Hyperfile or Oracle to store data provide by the graphic interface and Image analysis



General Process of color analysis

High number of combination of RGB for each image

STEP 1 = Macro ImageJ (Threshold Value + Filter)

STEP 2 = Color classification (Ex: RHS)

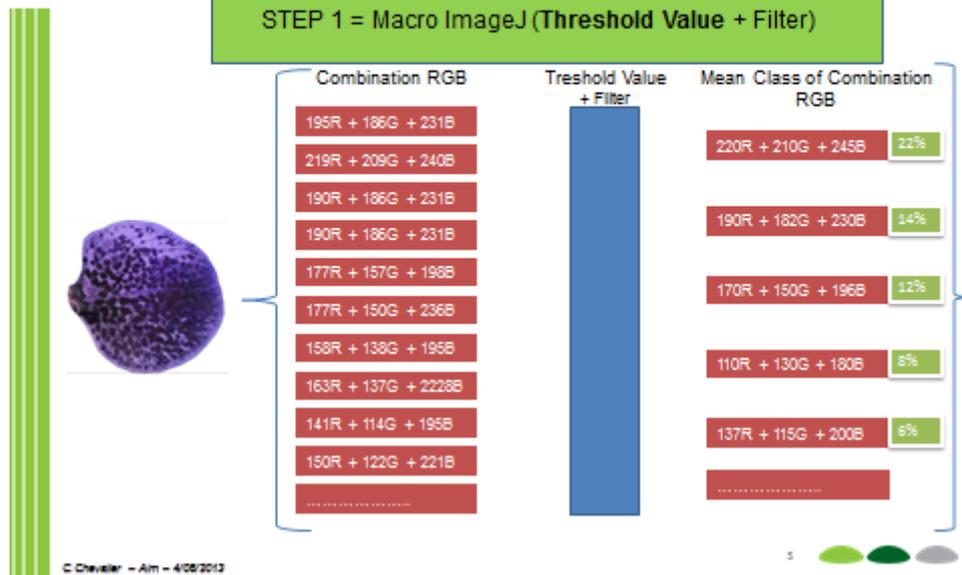
STEP 3 = Rank Color

Low number of combination of RGB for each image +
Link with colors of RHS classification



DETAIL OF THE COLOR ANALYSIS PROCESS

STEP 1 = Macro ImageJ (Threshold Value + Filter)



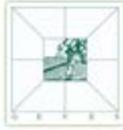
C Chevalier - Aim - 4/09/2013



STEP 2 = Color classification (Ex: RHS)



C Chevalier - Aim - 4/09/2013



STEP 3 = Rank Color

All colors

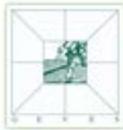
IMAGE_NOM	Rouge	Vert	Bleu	Peel_L_A	Rang de la couleur	RGB
TestHigh_1.jpg	188	204	183	79.20407	1	Very Pale Green (132)
TestHigh_2.jpg	211	217	211	12.67634	2	Greenish white (132)
TestHigh_3.jpg	188	191	186	5.57126	3	Pale Yellowish Green (196)
TestHigh_4.jpg	188	190	191	1.75449	4	Light Yellowish Green (143)
TestHigh_5.jpg	213	218	215	0.56451	5	Greenish white (132)
TestHigh_6.jpg	215	220	214	0.25437	6	Greenish white (132)
TestHigh_7.jpg	188	188	183	0.25948	7	Moderate Yellowish Green (147)
TestHigh_8.jpg	179	173	186	0.67176	8	Light Yellowish Green (144)
TestHigh_9.jpg	179	176	179	0.38537	9	Light Yellowish Green (144)
TestHigh_10.jpg	164	166	164	0.33024	10	Pale Yellowish Green (132)
TestHigh_11.jpg	169	175	169	0.27509	11	Light Greenish Gray (191)
TestHigh_12.jpg	173	170	167	0.24619	12	Light Yellowish Green (144)
TestHigh_13.jpg	169	179	174	0.56454	13	Very Pale Green (132)
TestHigh_14.jpg	167	170	164	0.50912	14	Light Yellowish Green (146)
TestHigh_15.jpg	176	175	171	0.20013	15	Light Yellowish Green (144)
TestHigh_16.jpg	209	214	215	0.20004	16	Greenish white (132)
TestHigh_17.jpg	30	33	70	14.90909	1	Dark Purple (30)
TestHigh_18.jpg	31	31	37	11.76471	2	Very Dark Green (10)
TestHigh_19.jpg	31	31	36	11.76471	3	Very Dark Green (10)
TestHigh_20.jpg	31	31	36	11.76471	4	Very Dark Green (10)
TestHigh_21.jpg	31	31	36	11.76471	5	Very Dark Green (10)
TestHigh_22.jpg	31	31	36	11.76471	6	Very Dark Green (10)
TestHigh_23.jpg	31	31	36	11.76471	7	Very Dark Green (10)
TestHigh_24.jpg	31	31	36	11.76471	8	Very Dark Green (10)
TestHigh_25.jpg	31	31	36	11.76471	9	Very Dark Green (10)
TestHigh_26.jpg	31	31	36	11.76471	10	Very Dark Green (10)
TestHigh_27.jpg	31	31	36	11.76471	11	Very Dark Green (10)
TestHigh_28.jpg	31	31	36	11.76471	12	Very Dark Green (10)
TestHigh_29.jpg	31	31	36	11.76471	13	Very Dark Green (10)
TestHigh_30.jpg	31	31	36	11.76471	14	Very Dark Green (10)
TestHigh_31.jpg	31	31	36	11.76471	15	Very Dark Green (10)
TestHigh_32.jpg	31	31	36	11.76471	16	Very Dark Green (10)
TestHigh_33.jpg	31	31	36	11.76471	17	Very Dark Green (10)
TestHigh_34.jpg	31	31	36	11.76471	18	Very Dark Green (10)
TestHigh_35.jpg	31	31	36	11.76471	19	Very Dark Green (10)
TestHigh_36.jpg	31	31	36	11.76471	20	Very Dark Green (10)
TestHigh_37.jpg	31	31	36	11.76471	21	Very Dark Green (10)
TestHigh_38.jpg	31	31	36	11.76471	22	Very Dark Green (10)
TestHigh_39.jpg	31	31	36	11.76471	23	Very Dark Green (10)
TestHigh_40.jpg	31	31	36	11.76471	24	Very Dark Green (10)
TestHigh_41.jpg	31	31	36	11.76471	25	Very Dark Green (10)
TestHigh_42.jpg	31	31	36	11.76471	26	Very Dark Green (10)
TestHigh_43.jpg	31	31	36	11.76471	27	Very Dark Green (10)
TestHigh_44.jpg	31	31	36	11.76471	28	Very Dark Green (10)
TestHigh_45.jpg	31	31	36	11.76471	29	Very Dark Green (10)
TestHigh_46.jpg	31	31	36	11.76471	30	Very Dark Green (10)
TestHigh_47.jpg	31	31	36	11.76471	31	Very Dark Green (10)
TestHigh_48.jpg	31	31	36	11.76471	32	Very Dark Green (10)
TestHigh_49.jpg	31	31	36	11.76471	33	Very Dark Green (10)
TestHigh_50.jpg	31	31	36	11.76471	34	Very Dark Green (10)
TestHigh_51.jpg	31	31	36	11.76471	35	Very Dark Green (10)
TestHigh_52.jpg	31	31	36	11.76471	36	Very Dark Green (10)
TestHigh_53.jpg	31	31	36	11.76471	37	Very Dark Green (10)
TestHigh_54.jpg	31	31	36	11.76471	38	Very Dark Green (10)
TestHigh_55.jpg	31	31	36	11.76471	39	Very Dark Green (10)
TestHigh_56.jpg	31	31	36	11.76471	40	Very Dark Green (10)
TestHigh_57.jpg	31	31	36	11.76471	41	Very Dark Green (10)
TestHigh_58.jpg	31	31	36	11.76471	42	Very Dark Green (10)
TestHigh_59.jpg	31	31	36	11.76471	43	Very Dark Green (10)
TestHigh_60.jpg	31	31	36	11.76471	44	Very Dark Green (10)
TestHigh_61.jpg	31	31	36	11.76471	45	Very Dark Green (10)
TestHigh_62.jpg	31	31	36	11.76471	46	Very Dark Green (10)
TestHigh_63.jpg	31	31	36	11.76471	47	Very Dark Green (10)
TestHigh_64.jpg	31	31	36	11.76471	48	Very Dark Green (10)
TestHigh_65.jpg	31	31	36	11.76471	49	Very Dark Green (10)
TestHigh_66.jpg	31	31	36	11.76471	50	Very Dark Green (10)
TestHigh_67.jpg	31	31	36	11.76471	51	Very Dark Green (10)
TestHigh_68.jpg	31	31	36	11.76471	52	Very Dark Green (10)
TestHigh_69.jpg	31	31	36	11.76471	53	Very Dark Green (10)
TestHigh_70.jpg	31	31	36	11.76471	54	Very Dark Green (10)
TestHigh_71.jpg	31	31	36	11.76471	55	Very Dark Green (10)
TestHigh_72.jpg	31	31	36	11.76471	56	Very Dark Green (10)
TestHigh_73.jpg	31	31	36	11.76471	57	Very Dark Green (10)
TestHigh_74.jpg	31	31	36	11.76471	58	Very Dark Green (10)
TestHigh_75.jpg	31	31	36	11.76471	59	Very Dark Green (10)
TestHigh_76.jpg	31	31	36	11.76471	60	Very Dark Green (10)
TestHigh_77.jpg	31	31	36	11.76471	61	Very Dark Green (10)
TestHigh_78.jpg	31	31	36	11.76471	62	Very Dark Green (10)
TestHigh_79.jpg	31	31	36	11.76471	63	Very Dark Green (10)
TestHigh_80.jpg	31	31	36	11.76471	64	Very Dark Green (10)
TestHigh_81.jpg	31	31	36	11.76471	65	Very Dark Green (10)
TestHigh_82.jpg	31	31	36	11.76471	66	Very Dark Green (10)
TestHigh_83.jpg	31	31	36	11.76471	67	Very Dark Green (10)
TestHigh_84.jpg	31	31	36	11.76471	68	Very Dark Green (10)
TestHigh_85.jpg	31	31	36	11.76471	69	Very Dark Green (10)
TestHigh_86.jpg	31	31	36	11.76471	70	Very Dark Green (10)
TestHigh_87.jpg	31	31	36	11.76471	71	Very Dark Green (10)
TestHigh_88.jpg	31	31	36	11.76471	72	Very Dark Green (10)
TestHigh_89.jpg	31	31	36	11.76471	73	Very Dark Green (10)
TestHigh_90.jpg	31	31	36	11.76471	74	Very Dark Green (10)
TestHigh_91.jpg	31	31	36	11.76471	75	Very Dark Green (10)
TestHigh_92.jpg	31	31	36	11.76471	76	Very Dark Green (10)
TestHigh_93.jpg	31	31	36	11.76471	77	Very Dark Green (10)
TestHigh_94.jpg	31	31	36	11.76471	78	Very Dark Green (10)
TestHigh_95.jpg	31	31	36	11.76471	79	Very Dark Green (10)
TestHigh_96.jpg	31	31	36	11.76471	80	Very Dark Green (10)
TestHigh_97.jpg	31	31	36	11.76471	81	Very Dark Green (10)
TestHigh_98.jpg	31	31	36	11.76471	82	Very Dark Green (10)
TestHigh_99.jpg	31	31	36	11.76471	83	Very Dark Green (10)
TestHigh_100.jpg	31	31	36	11.76471	84	Very Dark Green (10)

Filter on Rank Color



Main colors

IMAGE_NOM	Rouge	Vert	Bleu	Peel_L_A	Rang de la couleur	RGB
TestHigh_1.jpg	188	204	183	79.20407	1	Very Pale Green (132)
TestHigh_2.jpg	211	217	211	12.67634	2	Greenish white (132)
TestHigh_3.jpg	30	33	70	14.90909	1	Dark Purple (30)
TestHigh_4.jpg	31	31	36	11.76471	2	Very Dark Green (10)
TestHigh_5.jpg	238	186	243	22.51254	1	Very Pale Purple (30)

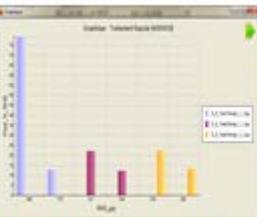


DEMONSTRATION THROUGH AN SIMPLE EXAMPLE



1 Run Macro ImageJ to get RGB Combination for each variety

Image	R	G	B	Peel_L_A	Color
TestHigh_1.jpg	188	204	183	79.20407	Very Pale Green (132)
TestHigh_2.jpg	211	217	211	12.67634	Greenish white (132)
TestHigh_3.jpg	30	33	70	14.90909	Dark Purple (30)
TestHigh_4.jpg	31	31	36	11.76471	Very Dark Green (10)
TestHigh_5.jpg	238	186	243	22.51254	Very Pale Purple (30)



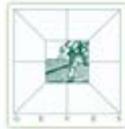
4 Graphic representation of the two main color for each variety

Image	R	G	B	Peel_L_A	Color
TestHigh_1.jpg	188	204	183	79.20407	Very Pale Green (132)
TestHigh_2.jpg	211	217	211	12.67634	Greenish white (132)
TestHigh_3.jpg	30	33	70	14.90909	Dark Purple (30)
TestHigh_4.jpg	31	31	36	11.76471	Very Dark Green (10)
TestHigh_5.jpg	238	186	243	22.51254	Very Pale Purple (30)

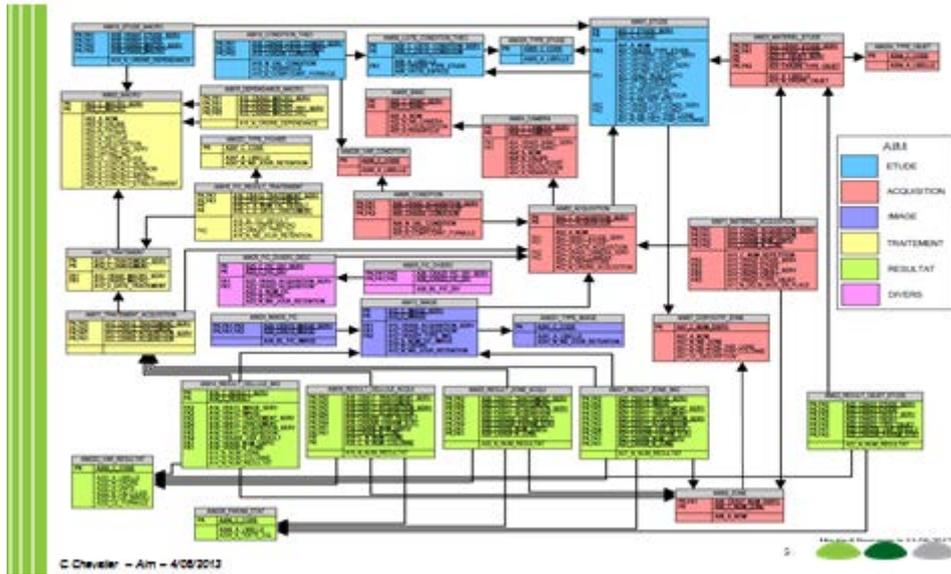
3 Get main colors of each variety

Image	R	G	B	Peel_L_A	Color
TestHigh_1.jpg	188	204	183	79.20407	Very Pale Green (132)
TestHigh_2.jpg	211	217	211	12.67634	Greenish white (132)
TestHigh_3.jpg	30	33	70	14.90909	Dark Purple (30)
TestHigh_4.jpg	31	31	36	11.76471	Very Dark Green (10)
TestHigh_5.jpg	238	186	243	22.51254	Very Pale Purple (30)

2 Link with color classification



DATA MODEL OF AIM APPLICATION



[End of Annex and of document]