wawasan open UNIVERSITY

the people's university

Sustainable Student Workshop Year 1 at Universiti Sains Malaysia (USM)

Programming is fun?

by
Tan Choo Jun
School of Science and Technology
Wawasan Open University (WOU)

12 May 2016

Biography

- Had more than 10-year experience in software design and development industry
- Doing Research and Development (R&D) in computational intelligence, specifically for multi-objective based optimisation and classification problems
- Working in School of Science and Technology at Wawasan Open University (WOU)
- Handling mixture courses of undergraduate and master programme: software engineering, information system, advanced manufacturing

Programming is fun?

Do you think so?

Programming is fun?

These are the answers from people:

1. Finding fulfilment and happiness in your career/study.
2. It requires thought, intention, action, and a willingness to change course when you've made mistakes.
3. Lays out a strategy for planning in software development.
4. Cultivating the desire to live a remarkable life.
5. Leading a remarkable life is something you have to discover as even being a reasonable goal.

Programming is fun?

Question: What can the programming do (during your study)?

Sharing on Research Project 1

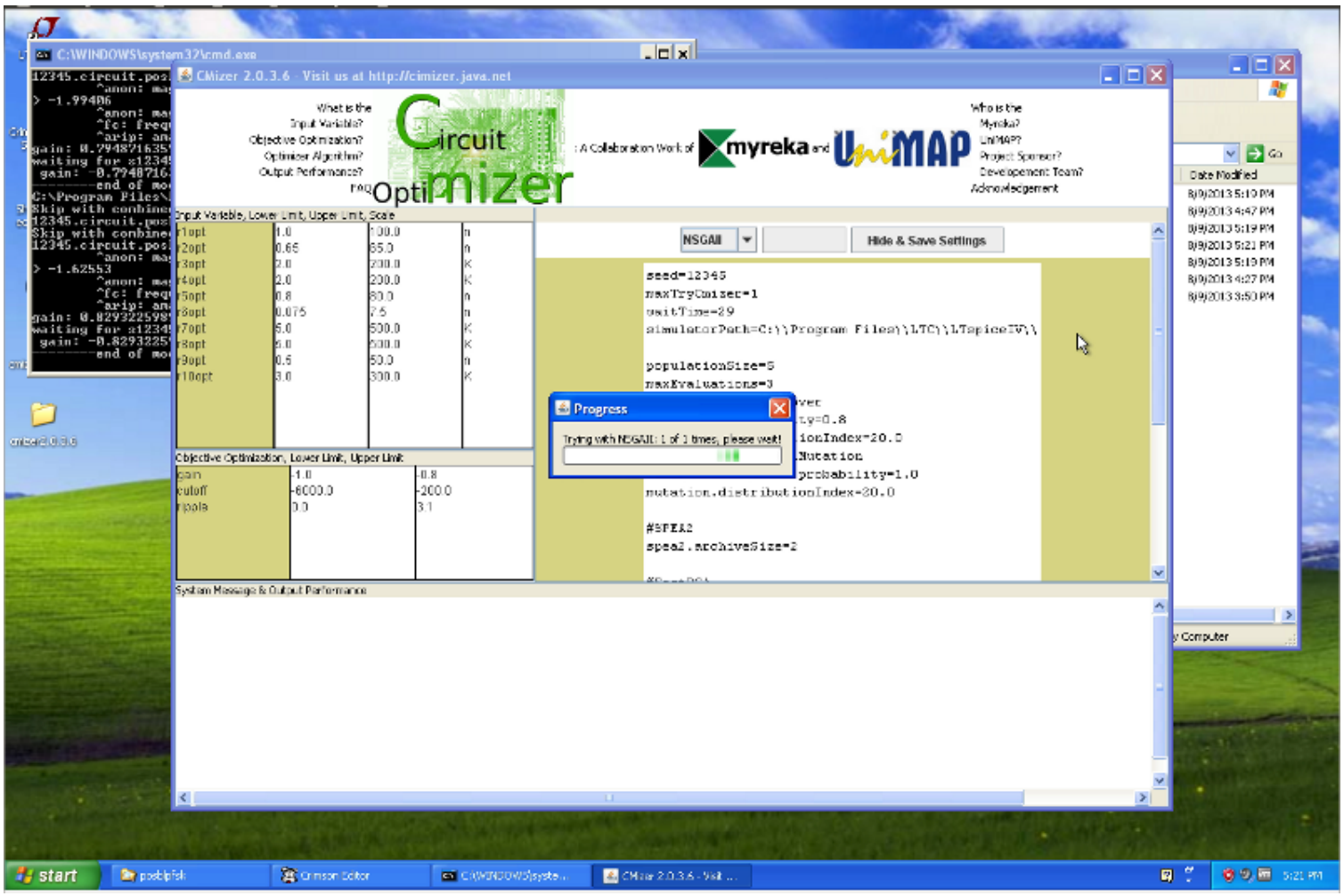
Cimizer

1. **Cmizer**: An intelligent Circuit optimizer
2. **Objective**: to provide decision support for electronic engineers to design circuits with a faster and easier manner, hence contributing towards the productivity of the electronic industries
3. **Award**: bronze medal for CIGIF 2012 - The 3rd Cyber International Genius Inventor Fair 2012 in South Korea

Cmizer's team

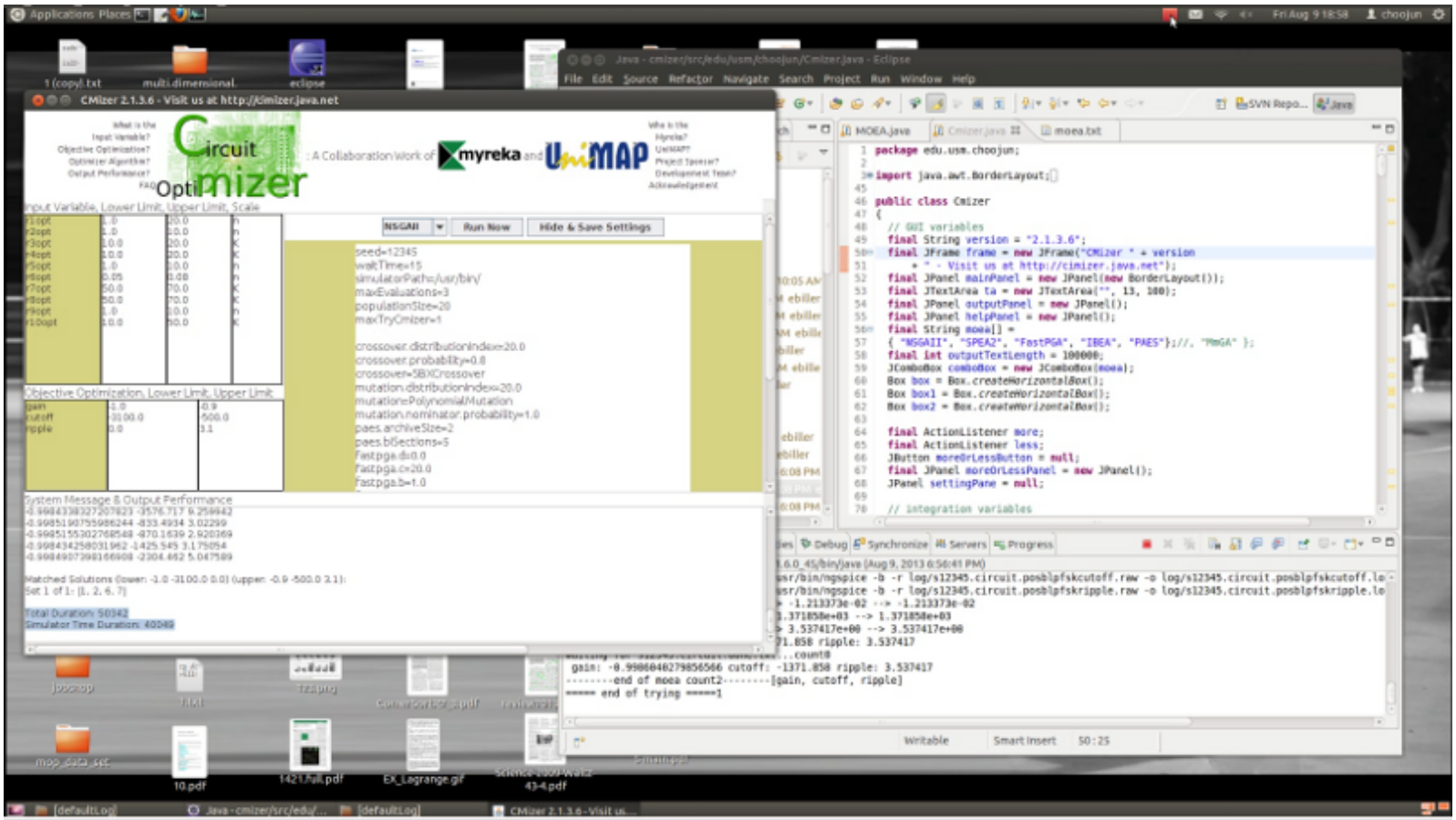
Sharing on Research Project 1

Cimizer in Windows



Sharing on Research Project 1

Cimizer: in Ubuntu (Linux)



Sharing on Research Project 1

Cimizer: in Ubuntu (Linux)

CIGIF 2012

2012 Korea Cyber International Genius Inventor Fair

Certificate of Award

This is to certify that

NEOH SIEW CHIN & LIM WEI JER
& TAN CHOO JUN

has been awarded

BRONZE MEDAL

in recognition of achievement made by the invention

MULTI-OBJECTIVE PARAMETER OPTIMIZATION MODEL FOR CIRCUIT DESIGN ASSISTANCE

successfully analyzed and demonstrated at the

Korea Cyber International Genius Inventor Fair, CIGIF 2012

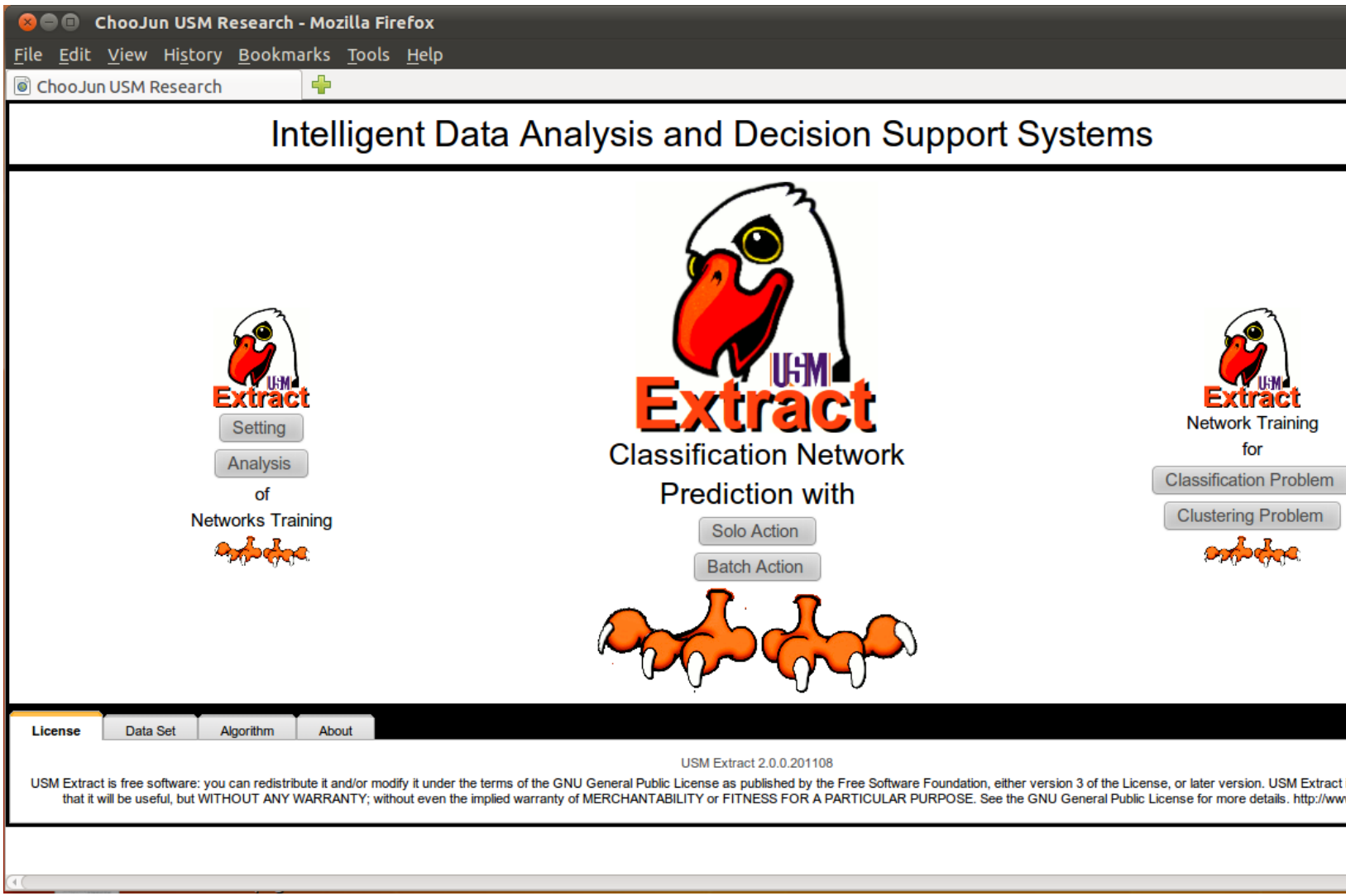
25 November 2012 in Seoul, Korea

Sharing on Research Project 2
USM Extract

1. **USM Extract**: A suite of soft computing and other data-based learning algorithms for Extracting information/knowledge from complex databases
2. **Objective**: to contribute towards the use of OSS-based intelligent systems in the Knowledge Discovery in Databases domain
3. **Award**: silver prize of the 5th Open Source Software (OSS) World Challenge, 2011 in South Korea

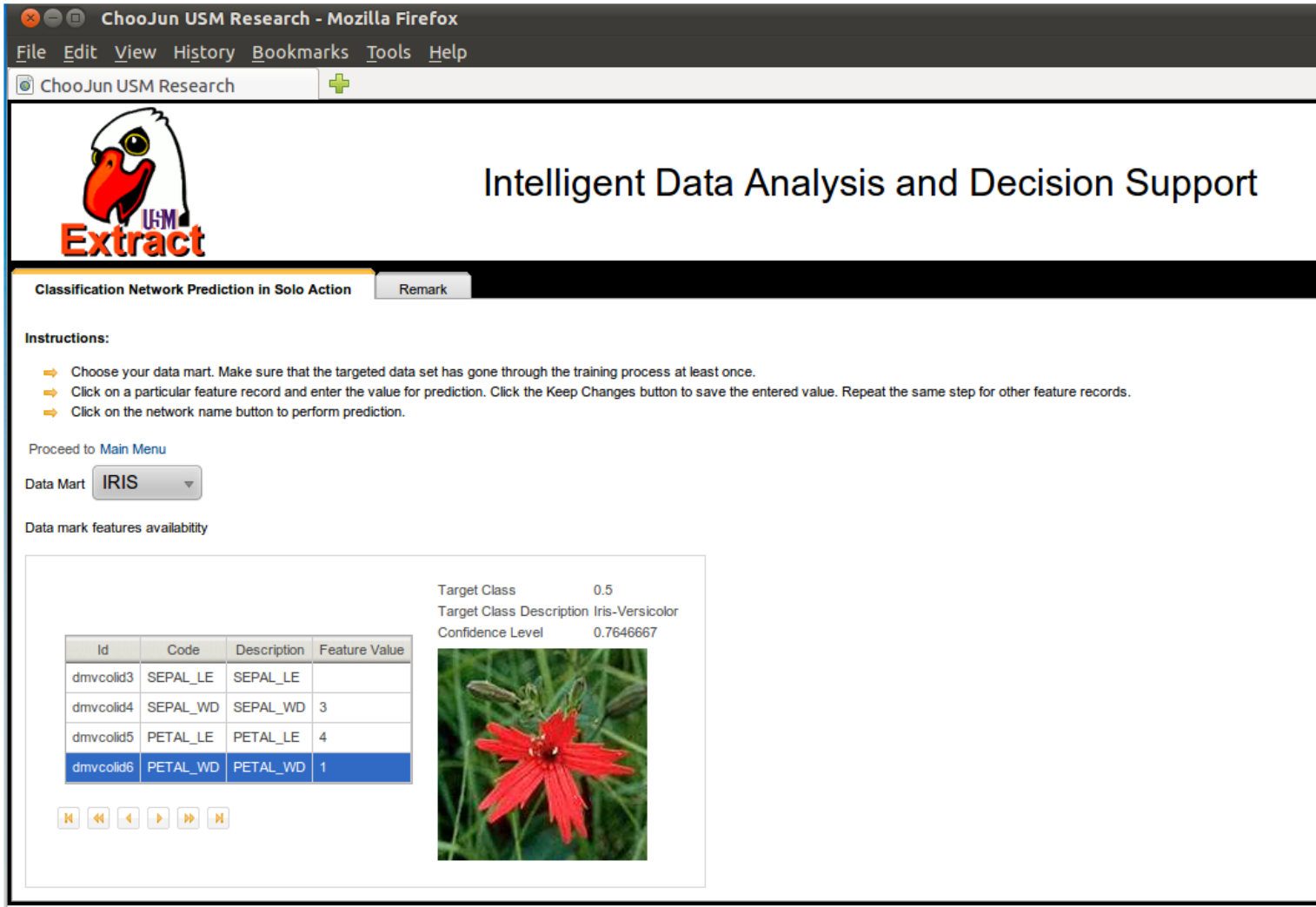
Sharing on Research Project 2

USM Extract identifying flower for farmer



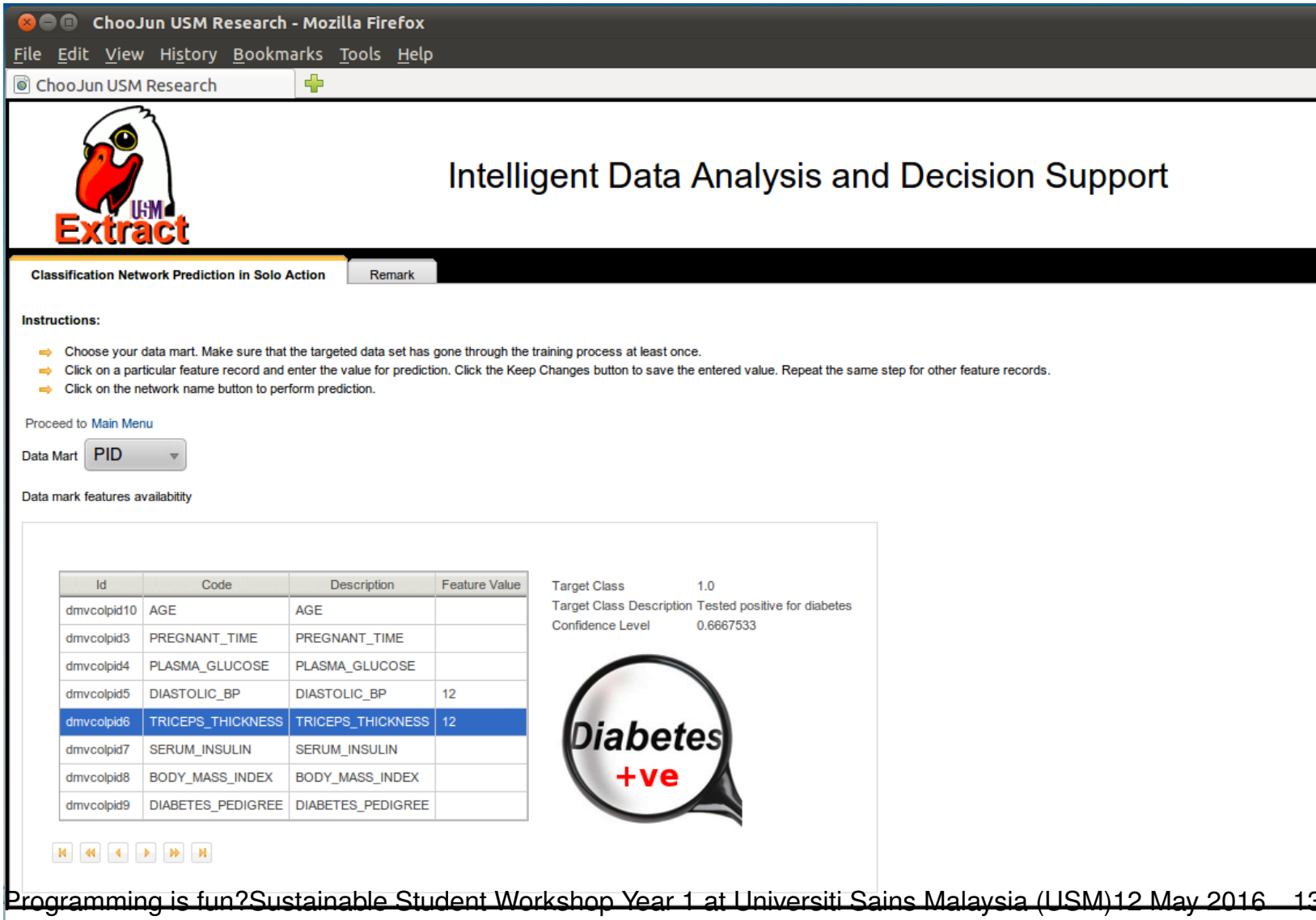
Sharing on Research Project 2

USM Extract identifying flower for farmer



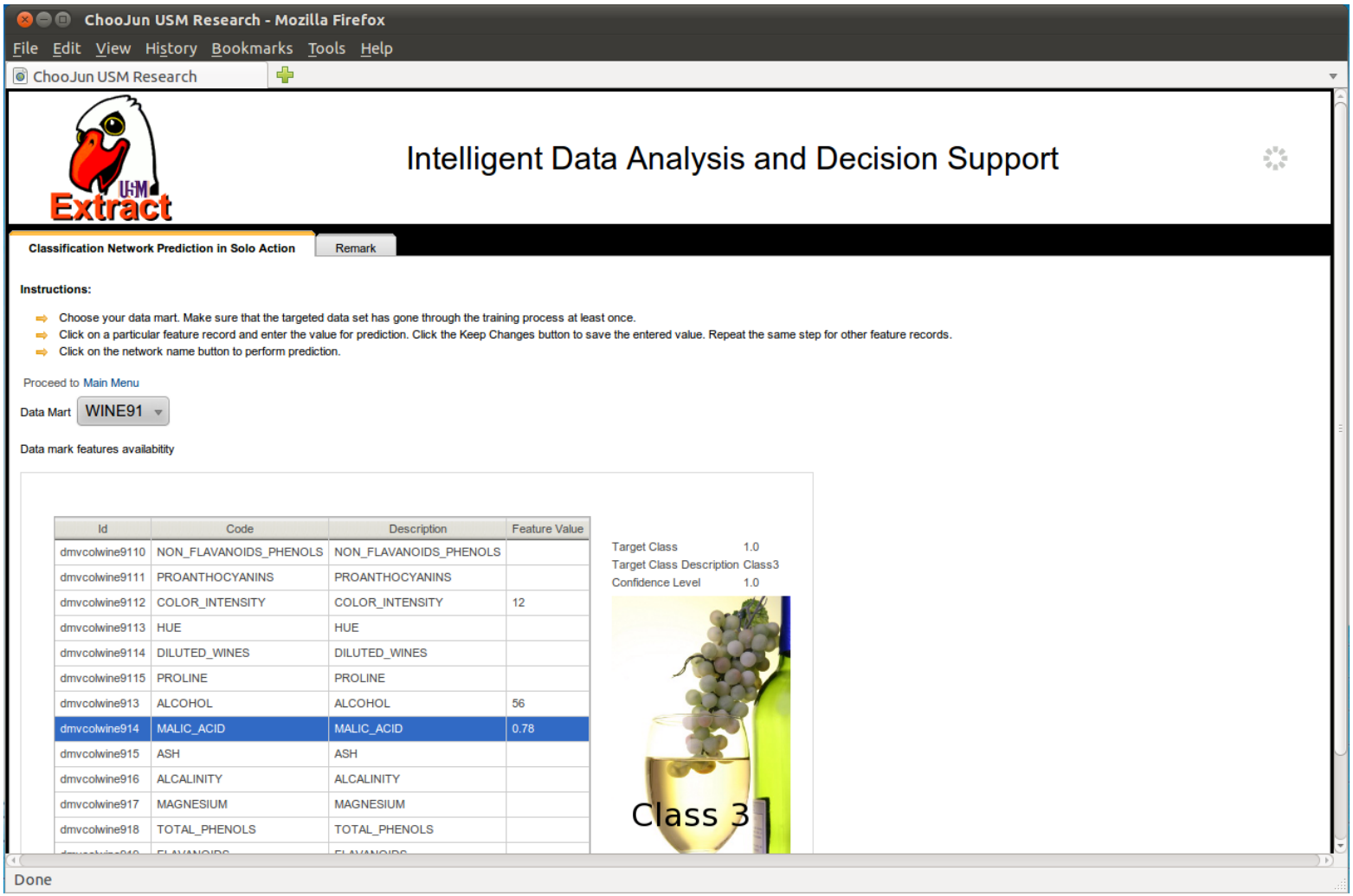
Sharing on Research Project 2

USM Extract diagnosing diabetes for medical doctor



Sharing on Research Project 2

USM Extract examining quality of wine for trader



Sharing on Research Project 2

USM Extract: Award ceremony in South Korea

Sharing on Research Project 2

USM Extract: Award ceremony in South Korea

Sharing on Research Project 2

USM Extract: Selected winners in the award ceremony

Sharing on Research Project 3

MDG (Mobile Desktop Grid)

1. **MDG**: An one-stop solution to obtain worldwide cluster resource for computational use
2. **Objective**: to resolve the problem of insufficient computational resources in addressing global issues
3. **Awards**: Malaysia Champion, Parasoft's Code Quality Challenge Award, and Sun MicroSystems Technology Award in the Open Jive Regional Challenge at Malaysia
4. **Award**: Sun MicroSystems Technology Award in the Open Jive Grand Finals Challenge

Sharing on Research Project 3

MDG (Mobile Desktop Grid)

Sharing on Research Project 3

MDG client interface in a handtop

Sharing on Research Project 3

MDG matching DNA structure and previewing in 3D format

Sharing on Research Project 3

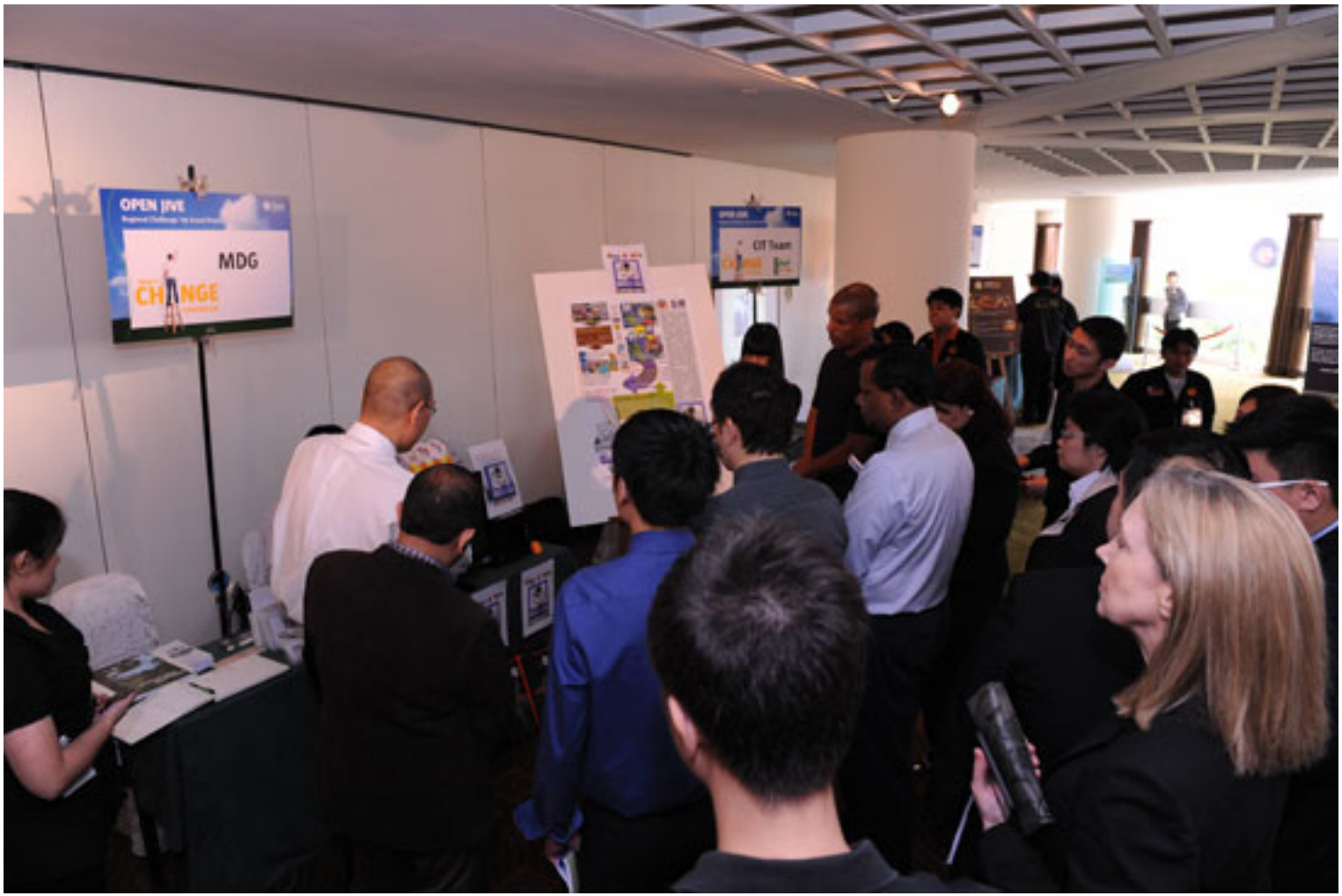
MDG: award ceremony in Bukit Jalil, Kuala Lumpur

Sharing on Research Project 3

MDG: demonstration booth in SunTech City, Singapore

Sharing on Research Project 3

MDG: demonstration booth in SunTech City, Singapore



Sharing on Research Project 3

MDG: demonstration in SunTech Conventional Centre, Singapore

Sharing on Research Project 3

MDG: award ceremony in SunTech City, Singapore

Sharing on Research Project 3

MDG: selected winners in the award ceremony

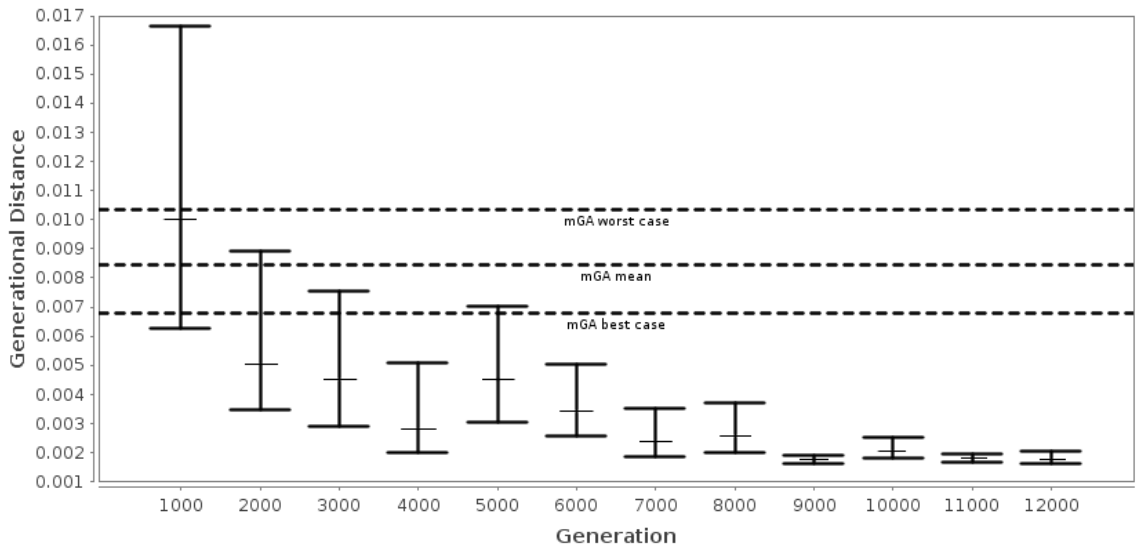
Programming is fun?

Question: What can the programming do (for further your study)?

Sharing on Research Publication 1

MmGA model: summary of Experiments with Selected Result

Key result: It achieved fast convergence with statistically better performance (at the 95% confidence level)



A comparison between I_{gd} of mGA (i.e. dotted lines) and bootstrapped I_{gd} of MmGA. The error bars indicate the 95% confidence intervals of the mean I_{gd} results of MmGA [1].

[1] Source: C. J. Tan, C. P. Lim, and Y.-N. Cheah, "**A modified micro genetic algorithm for undertaking multi-objective optimization problems**," Journal of Intelligent and Fuzzy Systems, vol. 24, no. 3, pp. 483–495, 2013.

Sharing on Research Publication 2

MmGA model: a Case Study of Multi-objective Job-Shop Scheduling at Australia

Key result: The requirements are satisfied within a fraction of the time with statistical significance results.

	Enumeration Method (worst to best)	Bootstrapped results of MmGA		
		Lower Bound	Mean	Upper Bound
5 Jobs				
Ψ (dollar)	4.5 to 5.16	4.97	5.03	5.08
Γ (day)	5.0 to 0.0	0.87	0.85	0.83
Time (ms)	$>$ 1000	2.8	3.23	4.23
6 Jobs				
Ψ (dollar)	11.09 to 14.87	11.92	12.26	12.67
Γ (day)	21.0 to 12.0	15.08	14.30	13.77
Time (ms)	$>$ 1000	10.37	12.93	17.37
7 Jobs				
Ψ (dollar)	13.68 to 14.49	13.93	14.00	14.08
Γ (day)	30.0 to 17.0	23.67	22.49	21.46
Time (ms)	$>$ 1000	4.23	4.53	5.17
8 Jobs				
Ψ (dollar)	17.5 to 19.06	17.74	17.86	18.01
Γ (day)	31.0 to 20.0	26.62	25.90	25.26
Time (ms)	$>$ 1000	4.87	5.17	5.43
9 Jobs				
Ψ (dollar)	13.4 to 16.77	13.70	13.79	13.92
Γ (day)	13.0 to 0.0	4.57	4.00	3.40
Time (ms)	$>$ 1000	6.00	6.23	6.43
10 Jobs				
Ψ (dollar)	14.06 to 17.98	14.47	14.60	14.79
Γ (day)	59.0 to 45.0	52.32	51.50	50.85
Time (ms)	$>$ 1000	7.87	8.10	8.67

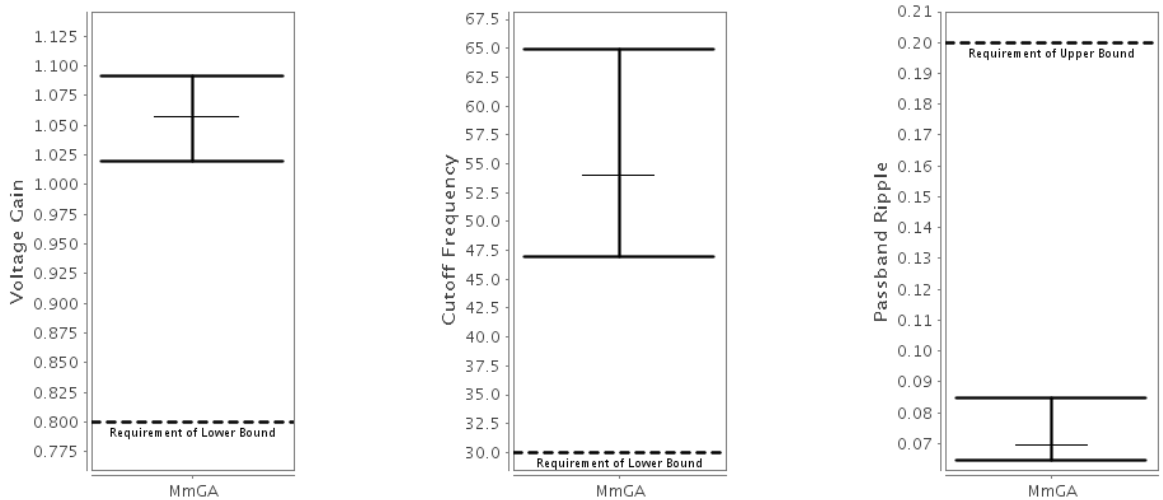
A comparison of Cost-Saving (Ψ) and Tardiness (Γ) with the enumeration method [2]

[2]Source: C. J. Tan, S. Hanoun, and C. P. Lim, "A multi-objective evolutionary algorithm-based decision support system: **A case study on job-shop scheduling in manufacturing**," in Systems Conference (SysCon), 2015 9th Annual IEEE International, April 2015, pp. 170–174.

Sharing on Research Publication 3

MmGA model: a Case Study of Optimization of Electronic Circuit Designs

- **Key result**: The stability of the average results is ascertained by the estimated 95% confidence intervals, which meet the requirements of the electronic engineer.



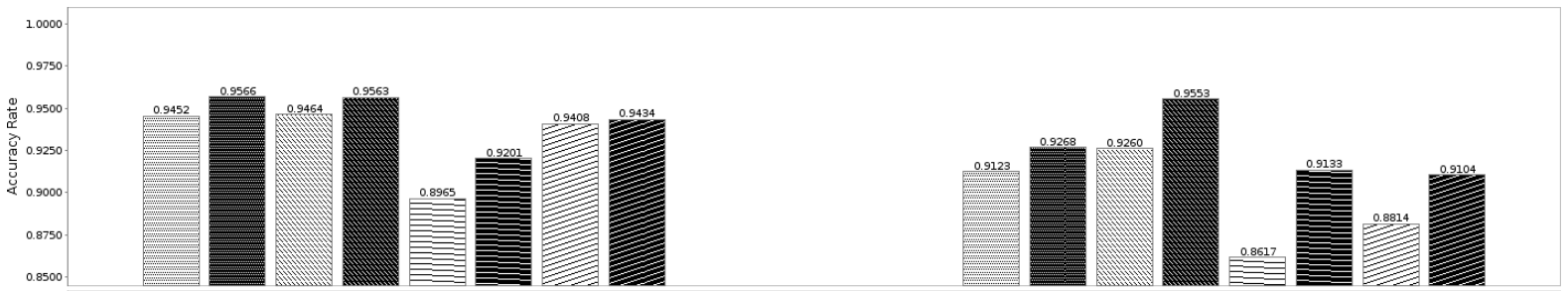
A comparison of voltage gain, cutoff frequency and passband ripple results between the MmGA model and the baseline requirement [3]

[3] Source: C. J. Tan and C. P. Lim, "**Optimization of Electronic Circuit Design Using Evolutionary Algorithm**," in International Symposium on Management Engineering, 2015 (ISME 2015). Kitakyushu, Japan: International Society of Management Engineers (ISME), 2015.

Sharing on Research Publication 4

MmGA ensemble model: a Case Study of Human Motion Detection and Classification

- **Key result**: It produced statistically better accuracy rates with fewer number of features (at the 95% confidence level) .

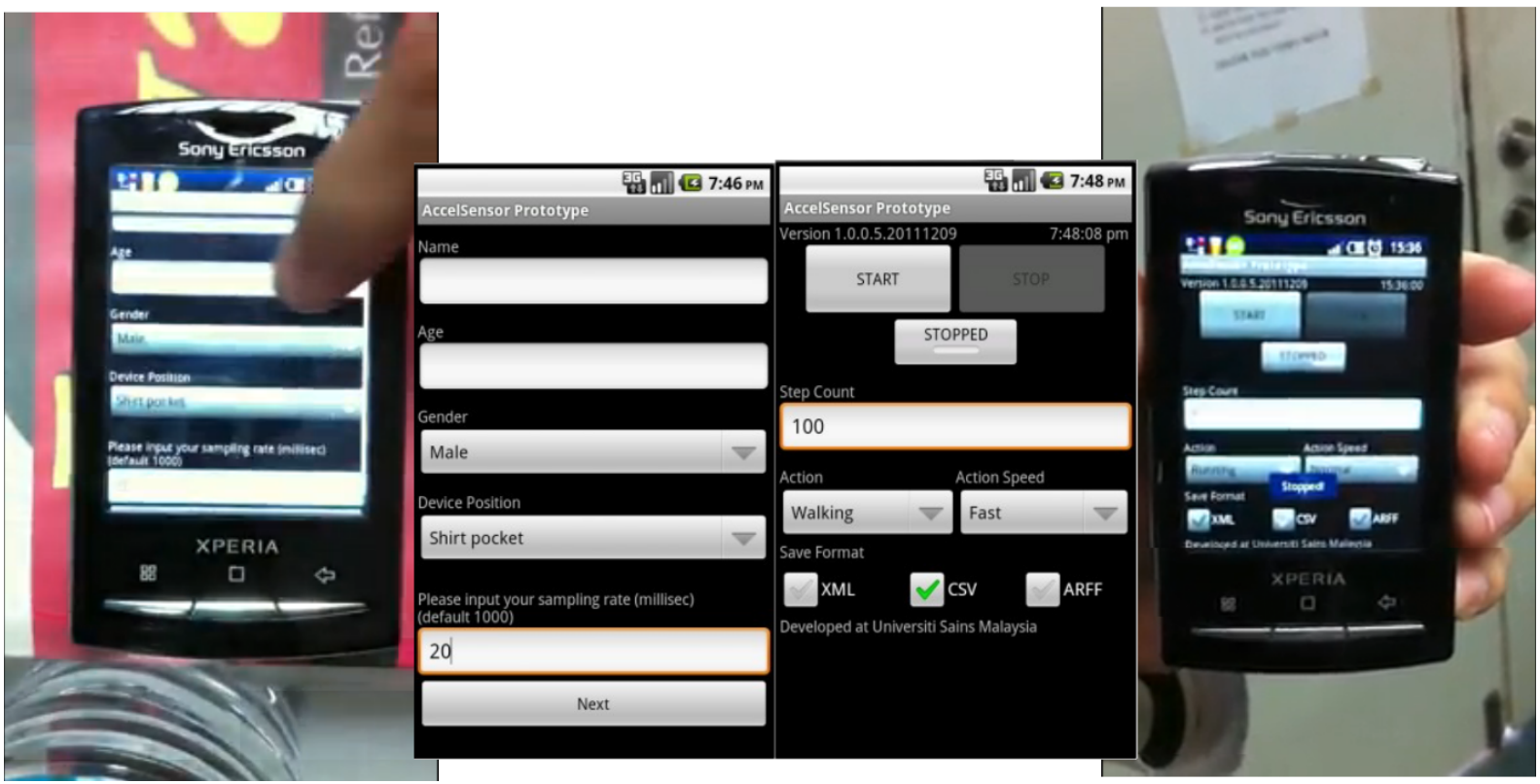


A comparison of the Accuracy rate between the standard classifiers and the MmGA Ensemble coupled with the similar set of classifiers. [4]

[4] Source: C. J. Tan, C. P. Lim, and Y.-N. Cheah, "**A multi-objective evolutionary algorithm-based ensemble optimizer for feature selection and classification with neural network models**," Neurocomputing, vol. 125, pp. 217–228, 2014.

Sharing on Research Publication 4

MmGA ensemble model: an Android-based application for data collection



Sharing on Research Publication 5

MmGA ensemble model: a Case Study of Text-based Amazon's Product Review Information Classification and Optimization

- **Key result**: It produced 50% reduction in the number of features (i.e., 1560 from 3114) with 3% reduction in accuracy.

	Accuracy (%)	No. of features
Electronics to Electronics	85.9%	1560
Kitchen Appliances to Kitchen Appliances	88.0%	1559
Electronics to Kitchen Appliances	82.3%	1560
Kitchen appliances to Electronics	83.0%	1560

A comparison of In-domain and cross-domain results between the SVM classifier and the MmGA Ensemble [5]

[5]Source: C. J. Tan, C. P. Lim, Y.-N. Cheah, and S. C. Tan, "**Classification and optimization of product review information using soft computing models**," in International Symposium on Affective Engineering, 2013 (ISAE 2013). Kitakyushu, Japan: Japan Society of Kansei Engineering, 2013, pp. 115–120.

Programming is fun?

Question: Does it work for you?

Programming is fun?

Answer: We have more options and ideas from **Mr. Muhamad Rashidi A. Rahman** if they do not work for you.

Let's 'Teh tarik' together!

Thank You

Visit us at www.wou.edu.my