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(1) Solar System Design and Practical verification

1) Using the Taguchi method and grey relational analysis to optimize the The photovoltaic-thermal system.

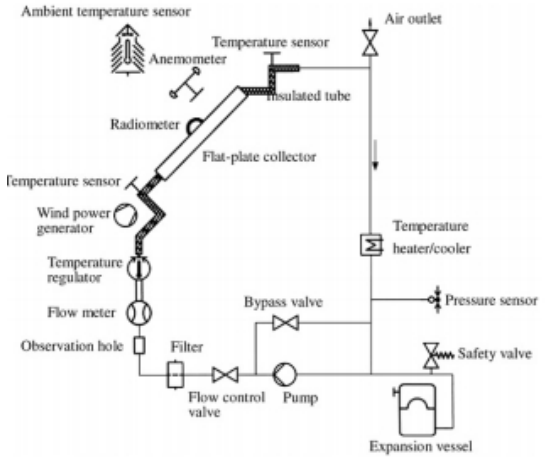
2) The efficiency coefficient and heat dispersion factor are respectively 0.7911 and 3.470 W/°C m^2.

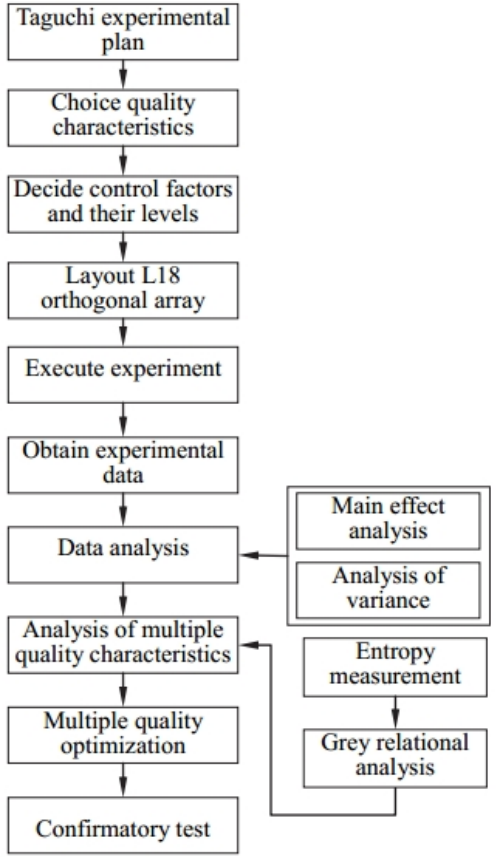
Controlling factors of the flat-plate collector and their levels.

Controlling factor		Level value		
		1	2	3
A	Collector tube material	(A_1) Copper	(A_2) Stainless steel	
B	Endothermic plate material	(B_1) Aluminum	(B_2) Copper	(B_3) Stainless steel
C	Number of collector tubes (piece)	(C_1) 8	(C_2) 11	(C_3) 14
D	Collector tube diameter (1/8")	(D_1) 3	(D_2) 4	(D_3) 5
E	Absorption film type	(E_1) Tinox	(E_2) Vacuum sputtering	(E_3) Spray painting
F	Thickness of the bottom heat insulating material (cm)	(F_1) 2.5	(F_2) 3.8	(F_3) 5

Interference factors of the flat-plate collector and their levels.

Interference factor		Level value		
		1	2	3
p	Illumination intensity (W/m^2)	(p_1) 800	(p_2) 900	(p_3) 1000
q	Temperature (°C)	(q_1) 10	(q_2) 20	(q_3) 30





Chung-Feng Jeffrey Kuo*, Jui-Min Liu, Mega Lazuardi Umar, et al. (2019, Jan). The photovoltaic-thermal system parameter optimization design and practical verification. Energy Conversion and Management, 180, 358-371. (SCI, 3/136, Mechanics) (Impact factor: 8.208)

(2) Materials and Medical Engineering

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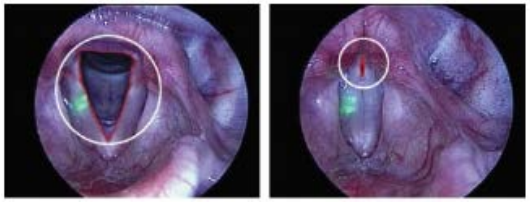
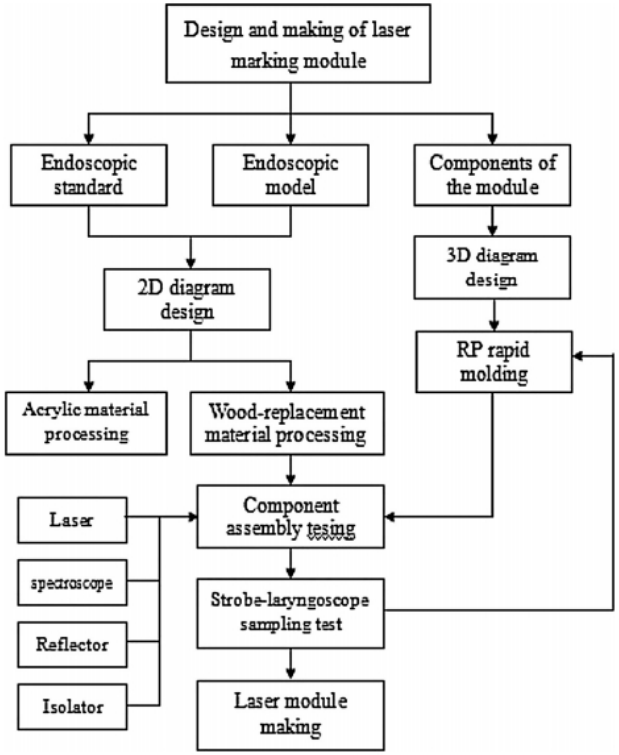
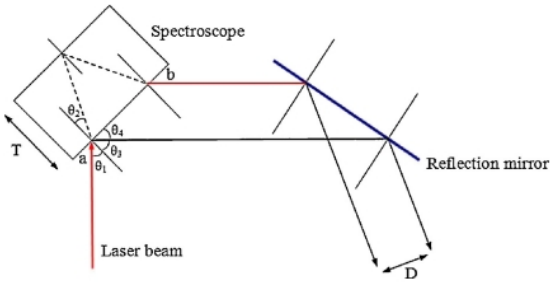
This study designs an innovative materials for laser projection marking module for the laryngeal video stroboscope to provide reference parameters for image scaling conversion.







Chung-Feng Jeffrey Kuo, B.H. Ke, N.Y. Wu et al., (2017), Prognostic of tumor volume for patients with advanced lung cancer treated with advanced lung cancer treated with chemotherapy. Computer Methods and Programs in Biomedicine; 144(C): 165-177. (SCI, 16/108, Computer science, theory & methods (Impact Factor: 3.632)

(3) Medical Image Processing for Solid Tumors.

1) This study aimed to automatically detect and segment mediastinal lymph nodes, and to establish an objective method and reliable new response evaluation criteria to monitor the effectiveness of cancer treatment.

2) The proposed approach used weighted k-nearest neighbors for classification, achieving superior results with an accuracy and specificity of 97.5% and 99.4%, respectively.

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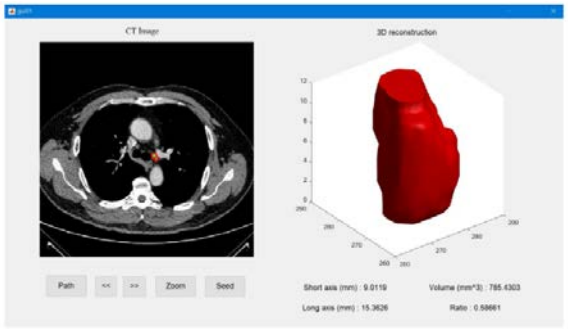

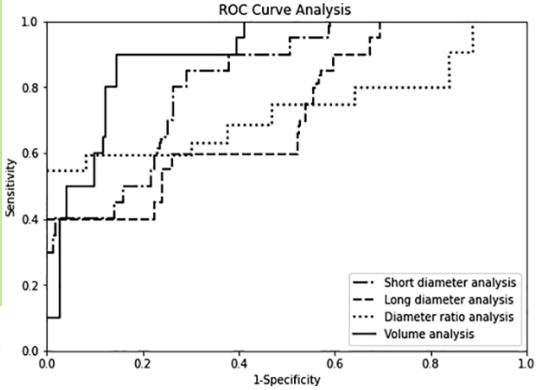

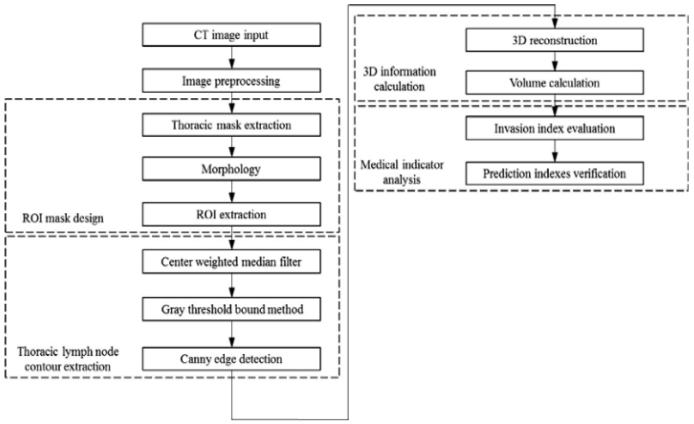

Fig. 1 – Research flow chart.

Table 5 – Medical diagnosis of lymph nodes.

Medical diagnosis		Actual T(Malignant)	F(Benign)	Total
This study	T(Malignant)	16	1	17
	F(Benign)	4	179	183
	Total	20	180	200

Chung-FengJeffrey Kuo, K.H. Lin, W.H. Weng, et al., (2021), Complete fully automatic segmentation and 3-dimensional measurement of mediastinal lymph nodes for a new response evaluation criteria for solid tumors. Biocybernetics and Biomedical Engineering; In press, (SCI, 40/87, Engineering, Biomedical)(Impact Factor: 2.537)

(4) Silicone Resin Synthesis

1) The 29Si-NMR spectra and 1H-NMR spectra confirmed the synthesized silicone resin containing phenyl group.

2) The optimum molecular weight of 3249 g/mol and the PhTES content was 2 % of the T-2 silicone resin.

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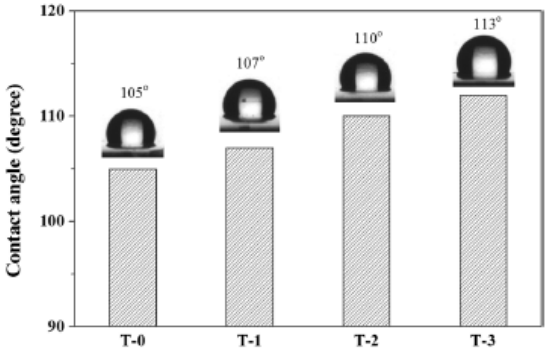
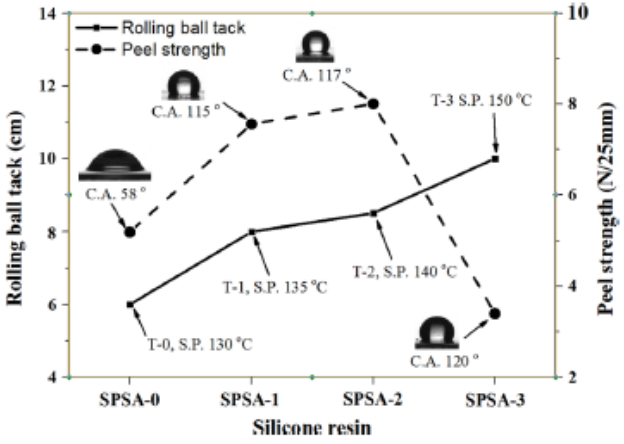
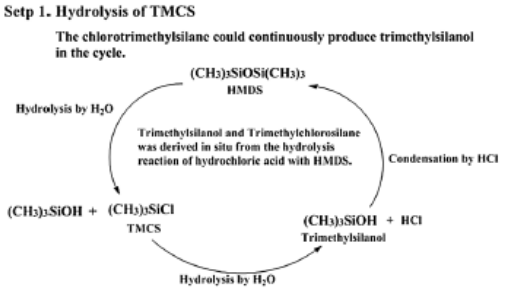
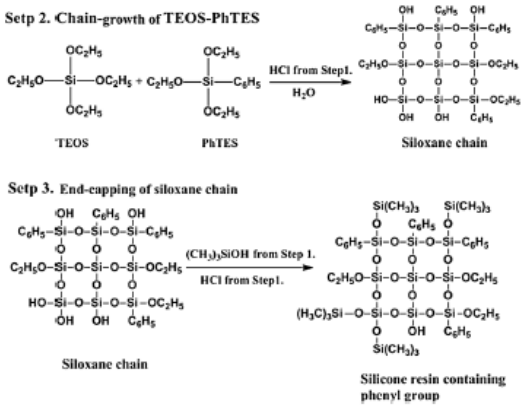
Code	Relative ratio of protons		
	[OH]/[*M*]	[EtO]/[*M*]	[Ph]/[*M*]
T-0	0.0059	0.060	0
T-1	0.0060	0.051	0.020
T-2	0.0063	0.048	0.029
T-3	0.0065	0.047	0.051









T.A. Zegeye, **Chung-Feng Jeffrey Kuo*** , H.M. Chen et al, (2017), Dual-confined sulfur in hybrid nanostructured materials for enhancement of lithium-sulfur battery cathode capacity retention. ChemElectro Chem; 4(3):636-647 (SCI, 10/27, Electrochemistry)(Impact Factor: 4.154)

(5) Material Processing and Control System Design

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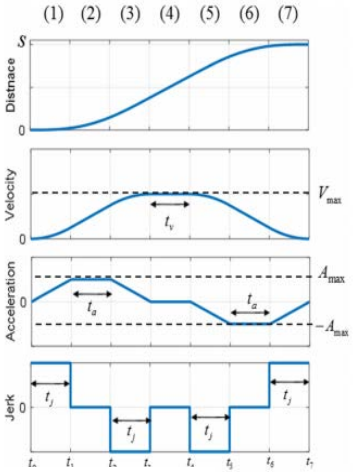
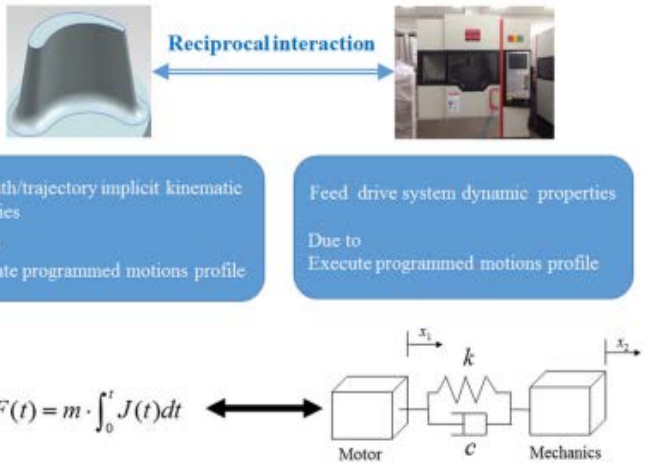
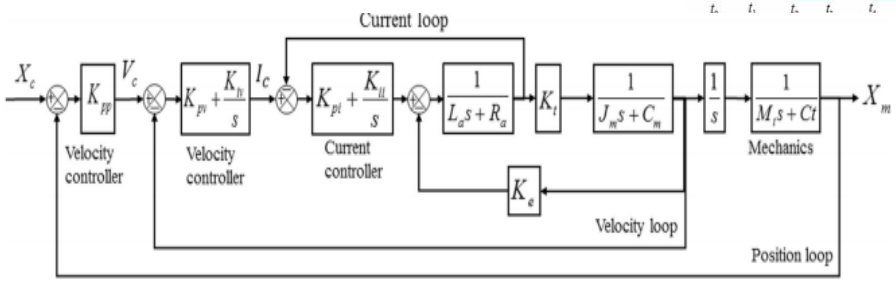
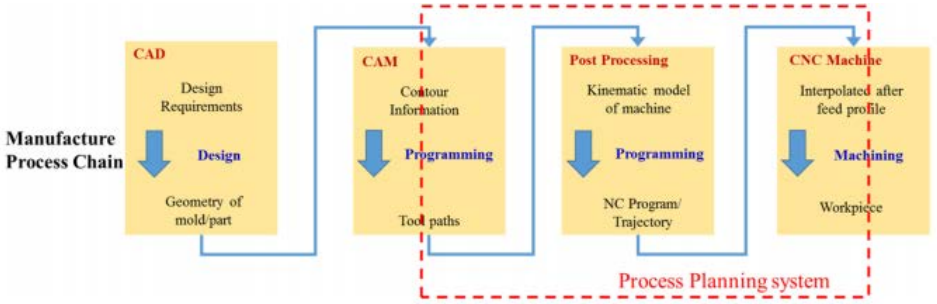
This study is to obtain a better finished surface quality and shorten the machining time without adding supplemental equipment or information is demonstrated experimentally on a five-axis CNC machine for a free-form vane that could help machining operators take maximum advantage of the smart production techniques.









Wei-Han Weng and **Chung-Feng Jeffrey Kuo*** (2019). Jerk decision for free-form surface effects in multi-axis synchronization manufacturing. The International Journal of Advanced Manufacturing Technology, 105(1-4), 799-812. (SCI, 25/50, Engineering, Manufacturing)(Impact factor: 2.633)

(8) Functional Dyeable Polypropylene Fabric Development

1) This study aims to develop dyeable modified polypropylene (PP) granules with disperse dye. The optimal dyeable modified PP granule process used polyester as a mixed copolymer.

2) According to the results, the multi-quality optimization of the ester pellets consisted of a modified Co-PBAT melting point of 170˚C, the modified Co-PBAT content of 9 wt%, the compatibilizer content of 3 wt%, and the mixing temperature of 205˚C.

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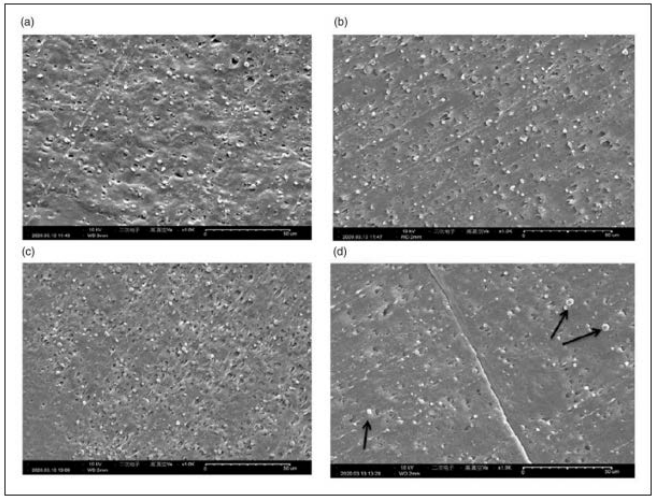

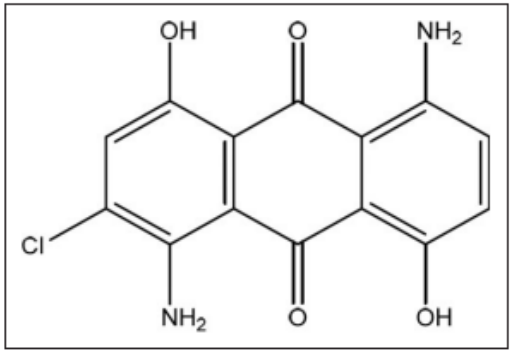

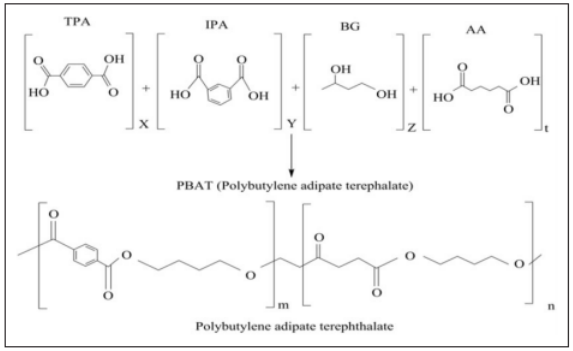

Table 4. Twin-screw extruder Taguchi factor and level planning

Control factor		Level value 1	2	3
A	Low-melting Co-PBAT melting point (°C)	150	160	170
B	low-meltingCo-PBAT content (wt%)	3	6	9
C	Compatibilizer content (wt%)	1	2	3
D	Die temperature (°C)	200	205	210

Chung-Feng Jeffrey Kuo and S.H. Chen, (2021), Functional dyeable polypropylene fabric development and process parameter optimization Part I: Dyeable modified polypropylene development with process parameter optimization. Textile Research Journal; p.0040517520984979. (SCI, 5/24, Materials Science, Textiles)(Impact Factor: 1.926)