



Fabrication of a Smart DNA Amplification Device



1. Title of Project : Fabrication of a Smart DNA Amplification Device

2. NPUST Research Team Members

Department	Name	Position
Department of Biomechatronics Engineering	Jyh Jian Chen	Professor
	Chun Yu Pan	Graduate student

3. Invited International Teachers and Students

Title of International School	Department	Name	Position
Kasetsart University	Department of Physics	Puchong Kijamnajsuk	Lecturer

4. Content of Research or Internship

The aim of the research is to fabricate a smart DNA amplification device to perform the DNA detection. This research continues our research experience and core technology in DNA detection field for the past several years. We combine the precision machining, thermal fluidic and biotechnology to develop smart portable nucleic acid amplification system. Mr. Puchong Kijamnajsuk has a expertise in heat and mass transfer fields, is familiar with electronic circuit design and microcontroller technology, and owns the experience on a 3D printer and mini CNC. He can achieve the preliminary goal of the design of electric circuit for thermal control during the staying at NPUST.

The current research area of Mr. Puchong Kijamnajsuk is aimed at developing the portable photo-acoustic and photothermal deflection system and active learning by virtual instrumentation for experimental physics. There is a considerable complementarity in the implementation of this research. In particular, the technology of the photothermal system will enhance the innovation of the content of the research. In the future, the design of the thermal control module of this nucleic acid amplification

system will be simplified.

5. Description of Performance

We attended the 10th Bilateral Conference between Kasetsart University and National Pingtung University of Science and Technology “Innovation in Agriculture, Agro-industry and Agri-business” during 27th – 28th November 2018. We co-published the paper “Fabrication of a portable device for loop mediated isothermal amplification”.



Figure 1. Welcome Party for UNTA Teachers.

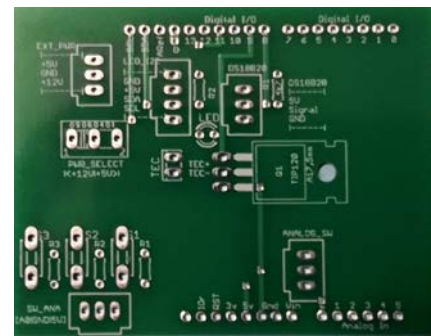


Figure 2. The printed circuit board for thermal control.



Figure 3. The 10th Bilateral Conference between Kasetsart University and National Pingtung University of Science and Technology.