Portable quantitative differential phase contrast microscopy module and deep learning reconstruction method thereof

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Experience:

School Name	Degree	Period
College of Optical Sciences, University of Arizona	Ph. D	2004/08~2008/09
College of Optical Sciences, University of Arizona	M. S.	2004/08~2008/09
Affiliation	**Title**	**Period**
Current Position		
Institute of Medical Device and Imaging, NTU	Professor	2019/08~present
Former Position		
Molecular Imaging Center, NTU	Division Chief	2012/01~2017/07
Opto-electronic Biomedical Research Center, NTU	Assistant Professor	2011/08~2015/07
Mechanical Engineering, MIT, USA	Postdoctoral Associate	2008/12~2011/07

Market Needs: The research of cells often brings the improvements in medicine or disease research. However, by using conventional bright field microscope, the thin and transparent cells can barely be observed. Also, another widely used microscope, fluorescence microscope, has the limitation including damage to the sample and photo-bleaching that limits long-term observation.

Our Technology: The technique takes advantage of digital pupil engineering and deep learning to reconstruct the phase of sample, and enable long-term monitoring on live cells or further research based on cells morphology or phenotype changing.

Strength:

1. There is no required preprocessing of the sample, such as dying, to do before the observation with the invention.
2. The invention can combine with commercial inverted microscope without changing new light source.
3. The invention is able to provide high resolution images and quantitative information.

Competing Products: Usual quantitative phase contrast microscopy system.

Intellectual Properties: Related patents have been applied for this invention.

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