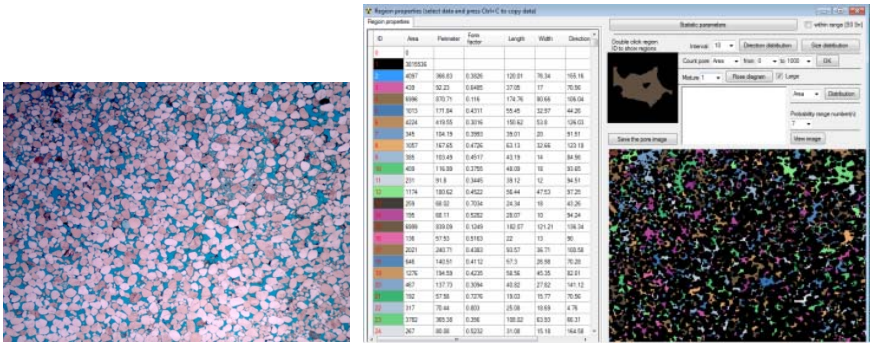
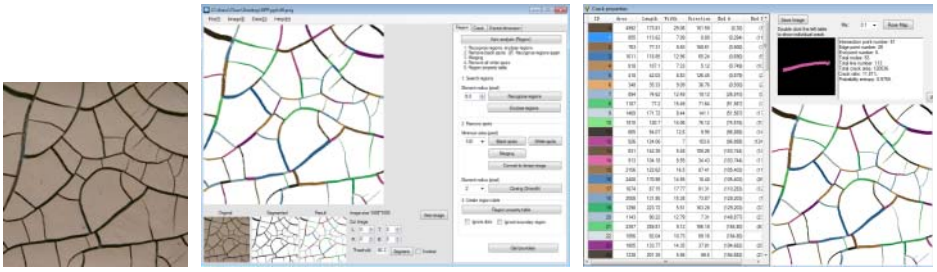
Particles (Pores) and Cracks Analysis System (PCAS)

- PCAS is professional software used to quantify pore system and crack system in images. The software can be used to identify various pores and cracks automatically. In comparison with traditional manual methods, image processing has the advantages of simplicity and high efficiency.
- Currently, PCAS has been purchased by several universities. And dozens of universities and institutes are using PCAS in their researches, including Stanford University, University of Oxford, University of Illinois, Technical University Munich, China Academy of Sciences, Nanjing University, Sun Yat-Sen University, Tongji University, etc. PCAS has been employed in the quantitative analysis of rock and soil cracks, micropores and mineral particles. The software can also be used in the field of materials and biological sciences. Some application examples are as follows:

Application examples of PCAS

High porosity sandstone -Stanford University	
Nanoscale pores of shale gas -Nanjing University	
Soil crack network -Nanjing University	
Vein network -University of Oxford	

孔隙编号	面积nm²	周长nm	形状因子	长度nm	宽度nm
1	909.70	137.91	0.60	58.04	25.78
2	394.72	83.08	0.72	31.42	17.01
3	212.29	62.78	0.68	25.00	12.56
4	1285.85	143.55	0.78	51.79	33.93
5	2550.72	258.96	0.48	86.56	56.70
6	626.38	96.96	0.84	37.55	21.86
7	1554.65	143.24	0.95	47.28	42.98
...	...	...	...	...	...
平均值	1600.84	153.26	0.74	55.98	32.65

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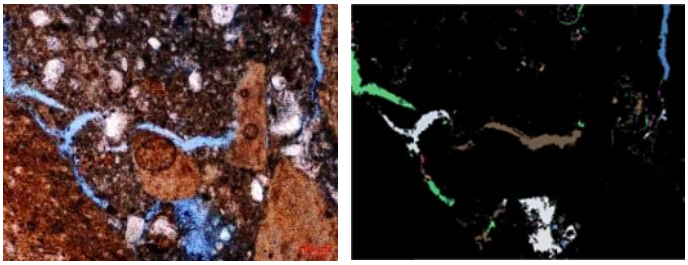
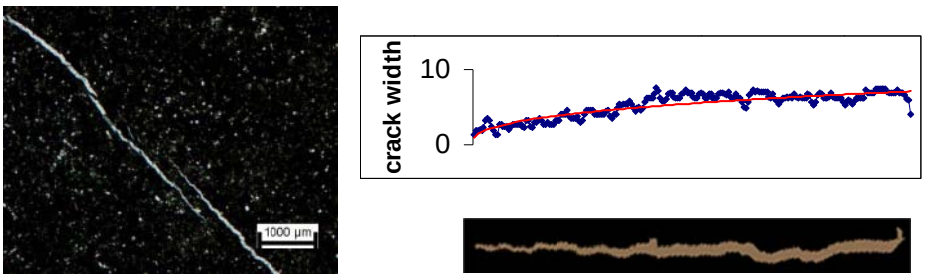
Micropore system of clay soil -Zhejiang University, Sun Yat-Sen University, etc.	
Mineral particles -Nanjing University	
Rock micro cracks -Stanford University	

On the basis of the results of PCAS, about twenty papers have been published in peer-review journals. Some principles of the PCAS w two papers：

Liu C., Shi B., Zhou J., Tang C., 2011. Quantification and characterization of microporosity by image processing, geometric measurement and statistical methods: application on SEM images of clay materials. Applied Clay Science, 54(1), 97-106 [doi: 10.1016/j.clay.2011.07.022]

Liu C., Tang C., Shi B., Suo W., 2013. Automatic quantification of crack patterns by image processing. Computers and Geosciences, 57, 77-80. [doi: 10.1016/j.cageo.2013.04.008]

More details：

http://acei.cn/program/PCAS

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