

## Supplementary Information

### **Quantification of combined color and shade change in colorimetry and image analysis: water pH measurement as an example**

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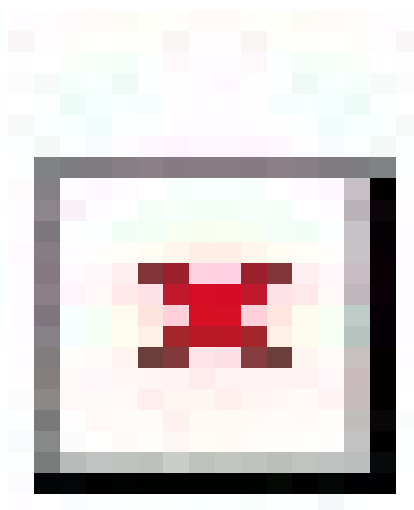


Fig S1 Curve estimation results.

This Fig S1 is the curve estimation results of linear, quadratic and inverse estimation which were discussed using SPSS during modeling, respectively.

**A MATLAB program file named GetAverage.m.**

The file GetAverage.m is used to calculate the mean RGB value of ROIs in MATLAB.

(Note: The program file has been uploaded separately)

**The images of parallel experiments (Corresponds to Fig.2)**

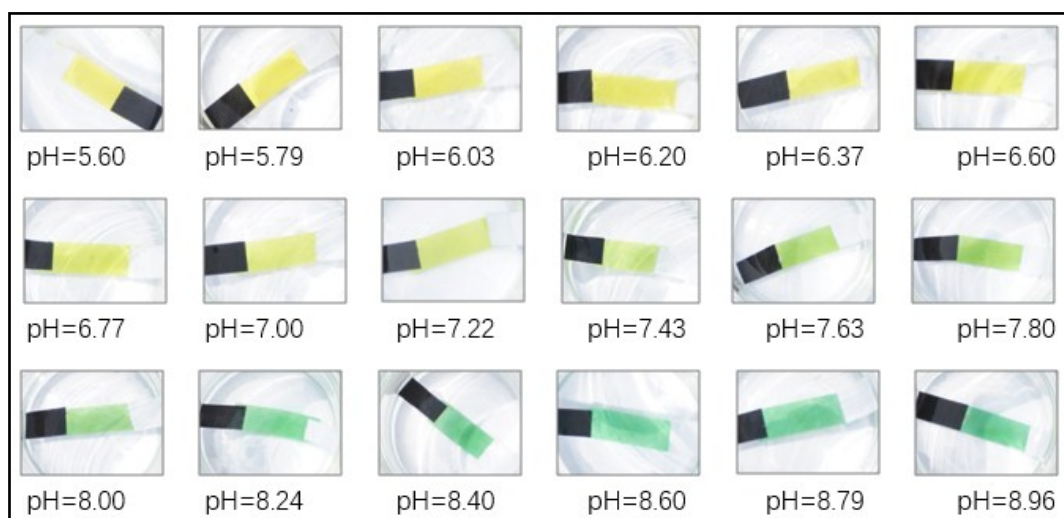


Fig.S2 Images of parallel experiment 1

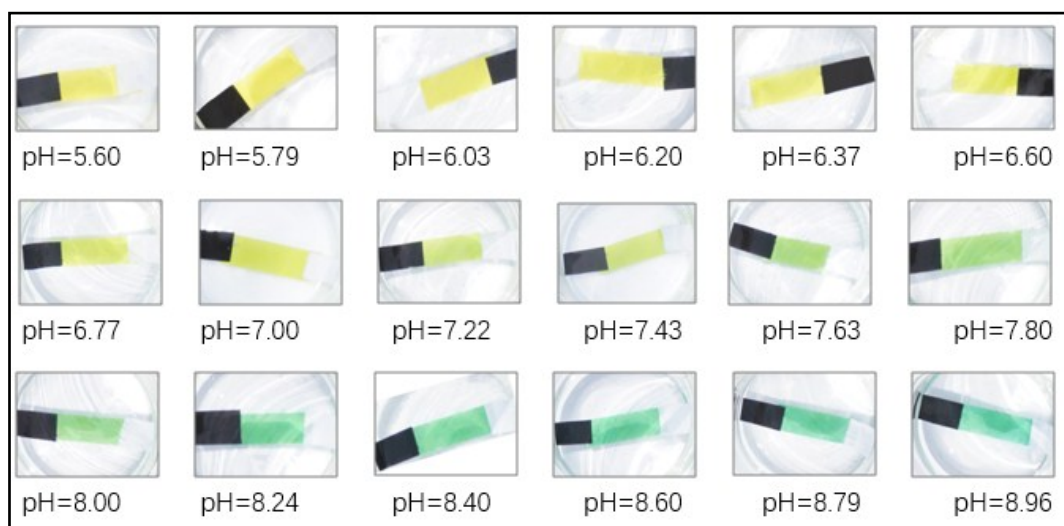


Fig.S3 Images of parallel experiment 2

**The images for the experiments in Table 5.**

The Fig.S4-Fig.S10 represent the original images of experiments under different light sources which corresponds to Table 5, respectively.

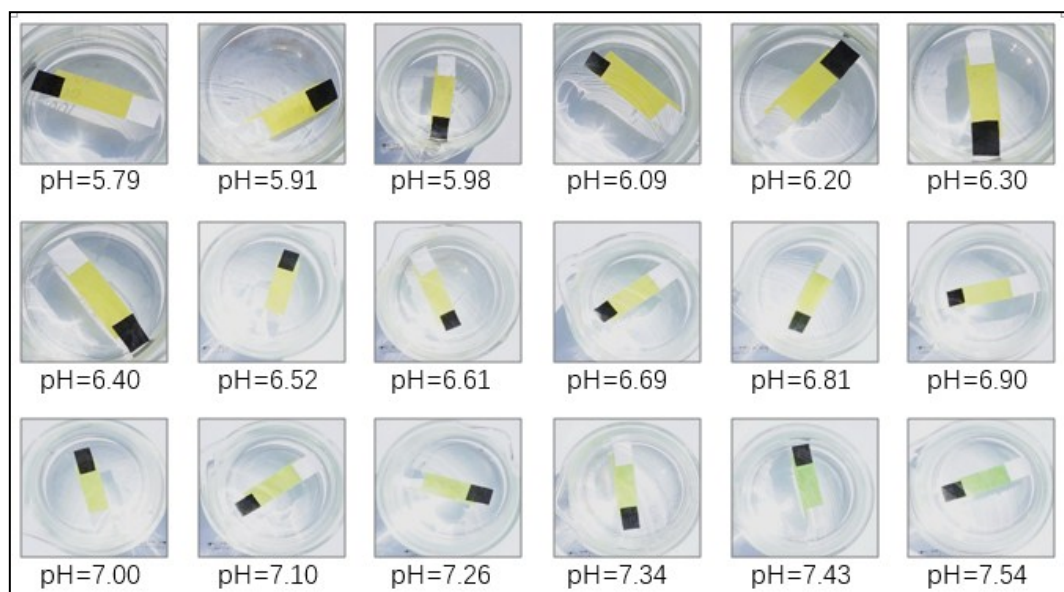


Fig.S4 2016-09-30-Natural light-test 1

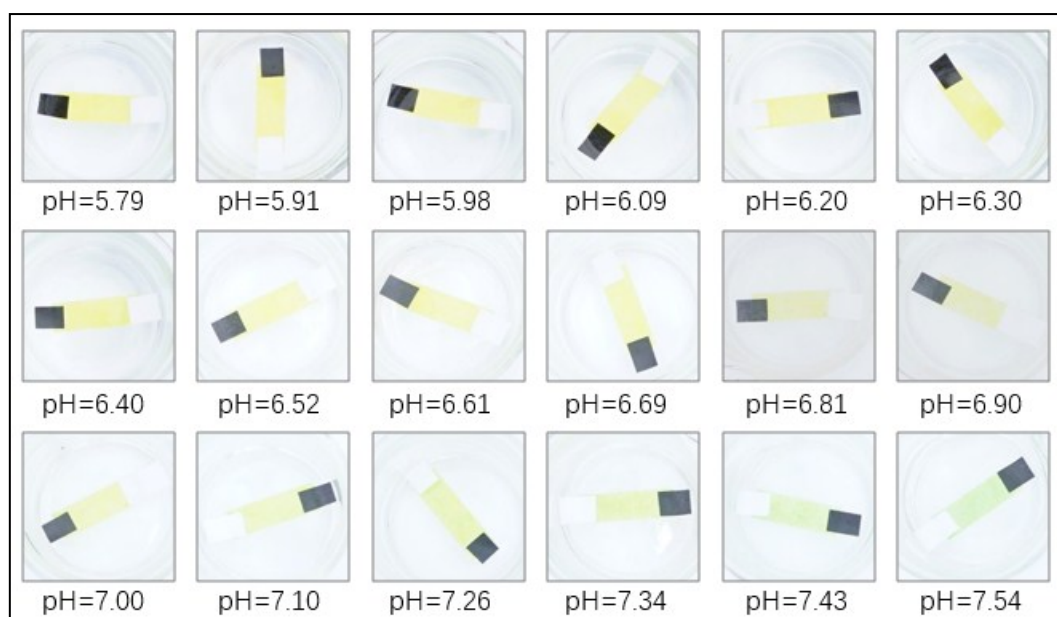


Fig.S5 2016-09-30-Natural light- test 2

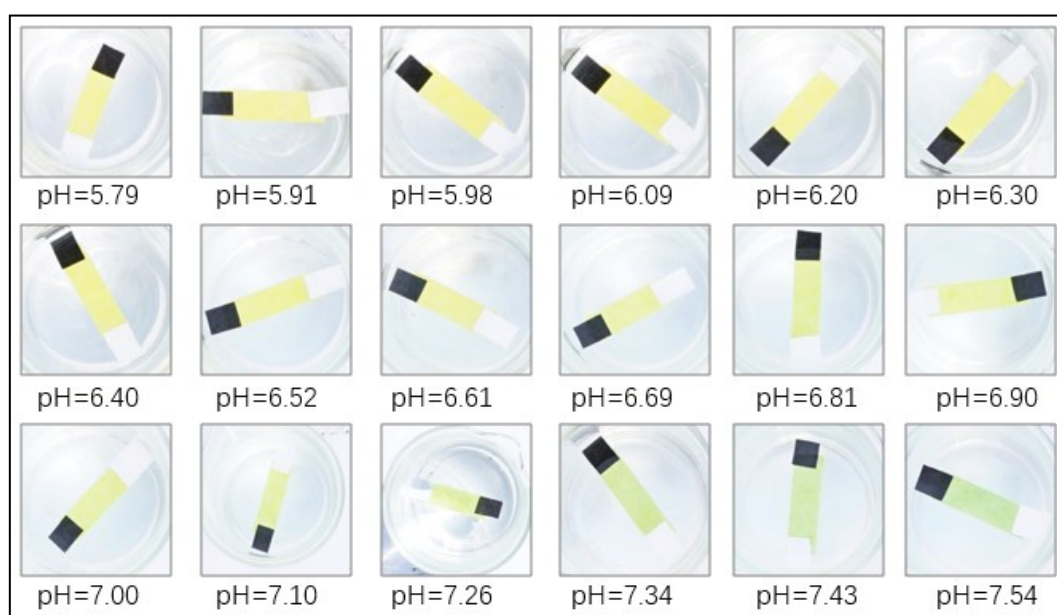


Fig.S6 2016-09-30-Natural light- test 3

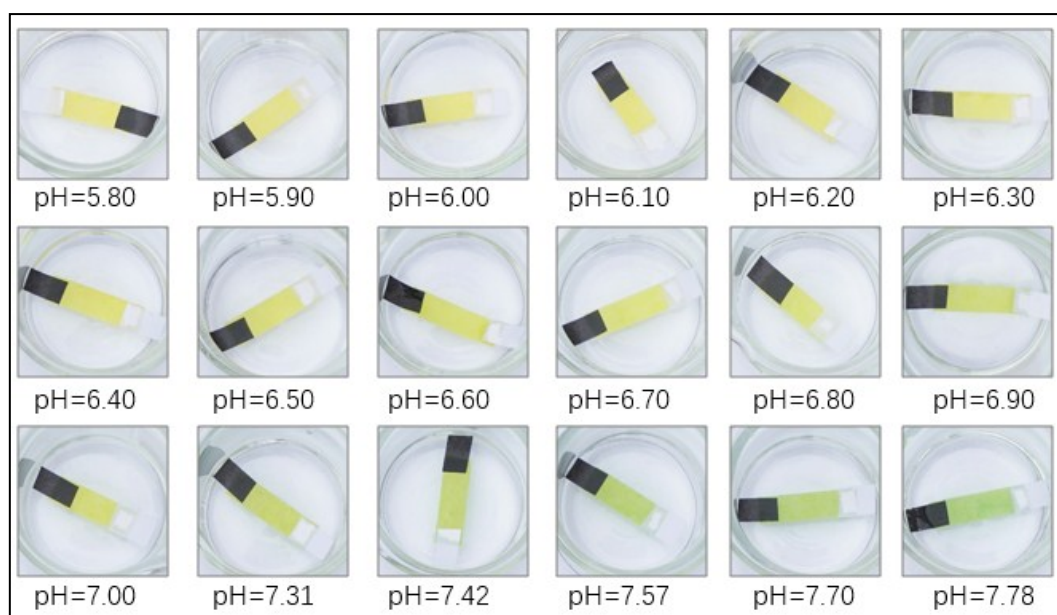


Fig.S7 2016-11-02-Natural light

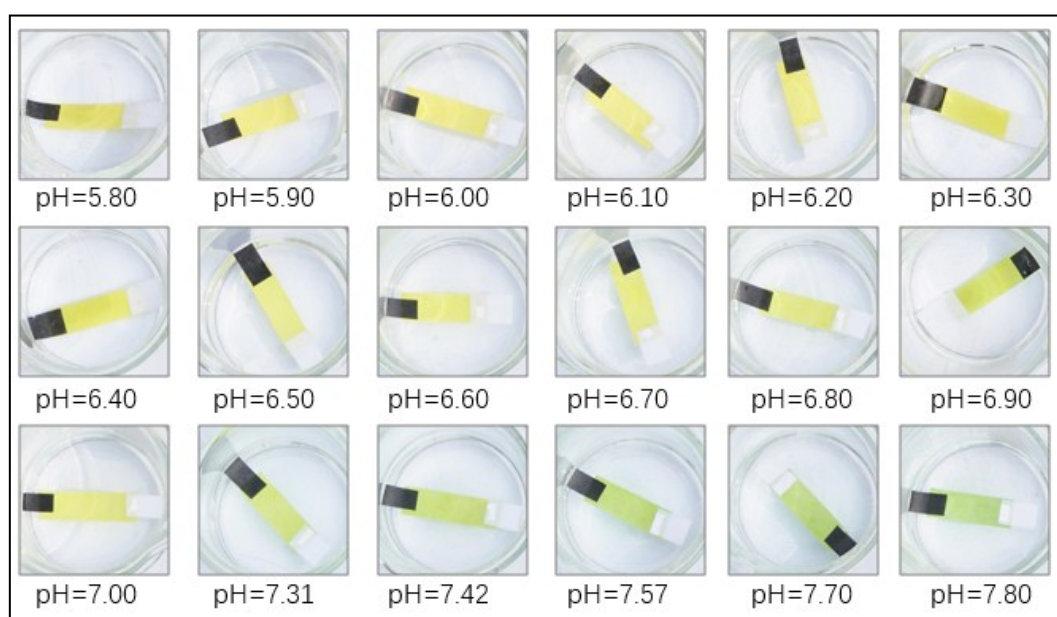


Fig.S8 2016-11-03-Natural light





Fig.S9 2016-11-20-Artificial light- test 1

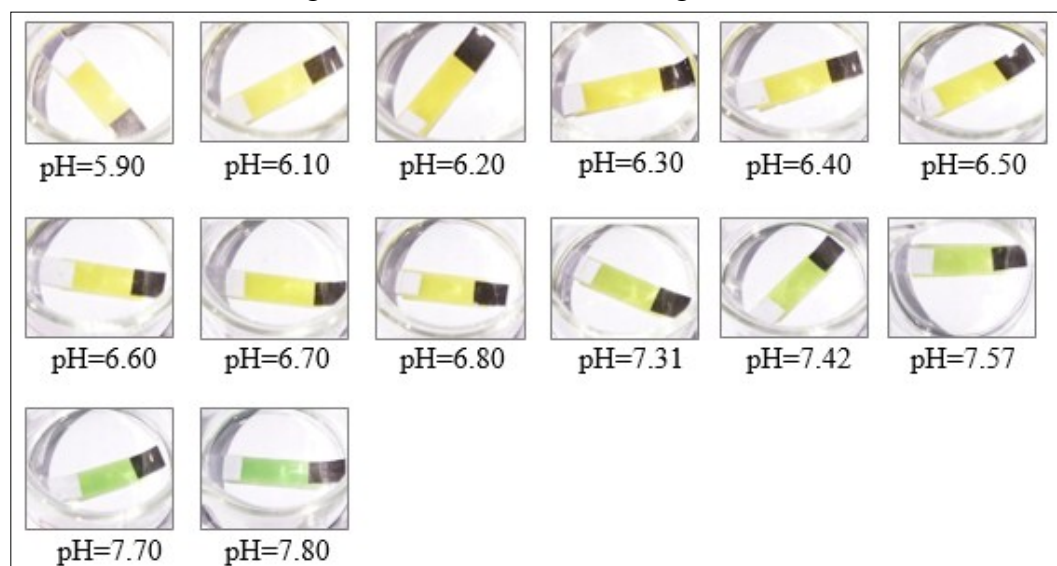


Fig.S10 2016-11-20-Artificial light- test 2

**The images for the experiments in Table 6.**

The brand 1, 2, 3 were commercial bottled water, the lake water-s1 and lake water-s2 were collected from different locations of the lake located in Southwest Jiaotong University Xipu campus.

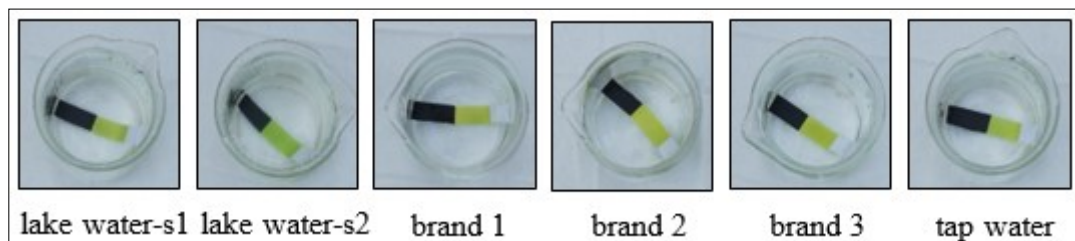


Fig.S11 The images of different water samples