What is claimed is:

1. A wafer surface nano-topography prediction method, comprising:

in a process of manufacturing a wafer, performing filtration and data processing on obtained surface topography measurement data of the wafer using a stepwise-designed filter, to obtain a measured nano-topography value *nt* of the wafer; and

predicting a predicted nano-topography value *NT* of the wafer after a follow-up manufacturing process based on a prediction function $f(nt) = NT$ and the measured nano-topography value *nt* of the wafer.

2. The method according to claim 1, wherein a size of the stepwise-designed filter is designed based on a target wavelength range, a sampling spacing and a sampling point position for the surface topography measurement data of the wafer, wherein the method comprises:

determining a filter using bivariate gaussian low-pass filter functions based on the target wavelength range;

determining a filter critical dimension based on a upper wavelength bound of the target wavelength range;

performing edge contraction based on the sampling point position; and

in a case that a distance between the sampling point position and a center of a surface of the wafer is smaller than or equal to the filter critical dimension, determining a radius of the stepwise-designed filter as a first radius; or , in a case that the distance between the sampling point position and the center of the surface of the wafer is greater than the filter critical dimension, determining the radius of the stepwise-designed filter as a second radius, wherein the first radius is greater than the second radius.

3. The method according to claim 2, wherein the determining a filter using bivariate gaussian low-pass filter functions based on the target wavelength range, comprises:

determining a first Gaussian low-pass filter function in which a low-pass filter range covers the upper bound of the target wavelength range;

determining a second Gaussian low-pass filter function in which a low-pass filter range covers a lower bound of the target wavelength range; and

obtaining a function G_{DHP} for describing the filter based on the first Gaussian low-pass filter function G_{LP1} and the second Gaussian low-pass filter function G_{LP2} through a formula $G_{DHP}=G_{LP1}(1-G_{LP2})$.

4. The method according to claim 2, wherein the performing filtration and data processing on obtained surface topography measurement data of the wafer using a stepwise-designed filter, to obtain a measured nano-topography value *nt* of the wafer, comprises:

after filtering the surface topography measurement data of the wafer using the stepwise-designed filter, obtaining a filter value at each sampling point position;

dividing all sampling points into at least one to-be-analyzed region based on a predetermined dimension;

obtaining a peak-to-valley (PV) value of each to-be-analyzed region based on a maximum filter value and a minimum filter value in each to-be-analyzed region; and

ranking PV values of all the to-be-analyzed regions in ascending order, and selecting the PV value based on a predetermined percentage as the measured nano-topography value of the wafer.

5. The method according to claim 1, further comprising:

performing mathematical modeling and fitting based on a measured nano-topography value of a historical wafer after a current manufacturing process and a measured nano-topography value of the historical wafer after the follow-up manufacturing process, and obtaining the prediction function through linear fitting or polynomial fitting.

6. The method according to claim 5, further comprising:

performing filtration and data processing on surface topography measurement data of the historical wafer using the stepwise-designed filter, to obtain the measured nano-topography value of the historical wafer.

7. A wafer surface nano-topography prediction apparatus, comprising: a filtering member and a prediction member, wherein

the filtering member is configured to, in a process of manufacturing a wafer, perform filtration and data processing on obtained surface topography measurement data of the wafer using a stepwise-designed filter, to obtain a measured nano-topography value *nt* of the wafer; and

the prediction member is configured to predict a predicted nano-topography value *NT* of the wafer after a follow-up manufacturing process based on a prediction function $f(nt) = NT$ and the measured nano-topography value *nt* of the wafer.

8. A computing device, comprising: a processor and a memory, wherein the processor is configured to execute an instruction stored in the memory to implement the method according to any one of claims 1 to 6.

9. A computer-readable storage medium storing therein at least one instruction, wherein the at least one instruction is executed by a processor to implement the method according to any one of claims 1 to 6.

10. A wafer, wherein in a case that a predicted nano-topography value NT of the wafer, obtained by the wafer surface nano-topography prediction method according to any one of claims 1 to 6, is smaller than 5 nm at a size of 2 mm*2 mm and/or smaller than 10 nm at a size of 10 mm*10 mm, a nano-topography value of the wafer is smaller than 5 nm at a size of 2 mm*2 mm and smaller than 10 nm at a size of 10 mm*10 mm.