for example, he/she can perform a continuous zoom in gesture, a rotation gesture followed by a zoom in gesture, a zoom out gesture followed by a rotation gesture, a rotation gesture followed by two zoom in gestures, etc.

[0057] In another embodiment of the present invention, the user can perform a multi-touch gesture using two or more multi-touch input devices. The multi-touch gesture recognition engine (MGRE) acquires input data from several multi-touch input devices at the same time and groups the corresponding separately-generated sets of input data in chronological order so as to provide a single set of input data that can be interpreted in a time-coherent manner. Then, the MGRE performs a continuous recognition of multi-touch gestures, as if they were only one big multi-touch input device. For example, FIG. **15** illustrates a two fingers stretch gesture performed on a graphical object shared by two multi-touch input devices (device A and device B). The user places one finger on the multi-touch device A (point "**1**") and one finger on the multi-touch device B (point"**2**"), preferably using both hands to interact. Then, the user moves them apart from each other to stretch the graphical object. This stretch gesture can also be performed by two users interacting at the same time.

[0058] In another arrangement, as illustrated in FIG. **16**, multi-touch gestures can be performed on a graphical object shared between two remote multi-touch input devices operatively connected using a network connection protocol such as TCP/IP or UDP. In this embodiment, the present invention can be used to recognize collaborative multi-touch gestures performed by at least two users, remote from each other, at the same time. For example, a two finger stretch gesture can be performed by two users moving one finger on a shared graphical object. By means of this embodiment, at least two users, remote from each other, can quickly interact with the same objects and data through multi-touch gestures, as if they were within the same room and using the same multi-touch input device. It can be used in a variety of scenarii from remote collaboration working group to gaming or fleet management.

[0059] The various embodiments of the invention can be used separately or in any combination.

[0060] The present invention has been described in the context of preferred embodiments, and for various ones of those embodiments a number of variations and examples thereof. It is to be understood that not every embodiment of the invention has been described. Those of skill in the art will appreciate that variations and modifications may be made without departing from the scope and spirit of the appended claims. Therefore, it is attended that the appended claims be interpreted as including the embodiments described herein, the alternatives mentioned above, and all equivalents thereto.

What is claimed is:

1. A computer implemented multi-touch (MT) gesture recognition (GR) method comprising the steps of:

Acquiring input data from a multi-touch input device;

Filtering input data and calculating meaningful features for gesture recognition;

Performing a continuous recognition of multi-touch gestures that allows users to start interacting with one multi-gesture and subsequently perform any other multi-touch gestures, if they want it, without needing to lift all their fingers off the multi-touch input device between each multi-touch gesture;

Performing at least one action during the user interaction sequence when a subset of input data is classified as a gesture.

2. The method of claim **1**, wherein the said multi-touch input device can be any combination of hardware, software and telecommunications.

3. The method of claim **1**, wherein input data is at least a list of contact points on said multi-touch input device.

4. The method of claim **3**, wherein a contact point can be a physical object, a finger, or any human body parts.

5. The method of claim **1**, wherein the said filtering input data step comprises a spatial segmentation method defined by the steps of:

Finding the underneath application for each contact point,

Associating each contact points within an application to a user interface element of this application,

Reducing the gesture recognition to a small set of gestures which are expected for this user interface element.

6. The method as recited in claim **1**, wherein said action consists in controlling a change in the user interface in accordance with the recognized gesture and its related features.

7. The method as recited in claim **1**, wherein the said action consists in providing a user feedback about the recognized gesture.

8. The method as recited in claim **1**, wherein the said action is the conjunction of a user feedback, a change made to the user interface and an application specific action.

9. The method as recited in claim **1**, wherein the said action is a backward compatibility module that interprets the recognized gesture as a command, convert the command to an equivalent sequence of mouse and/or keyboard events (mouse click, mouse move, key pressed, etc.) and sends these events to the underneath application as virtual mouse and/or keyboard events.

10. A computer implemented multi-touch (MT) gesture recognition (GR) method comprising the steps of:

Acquiring input data from at least two multi-touch input devices;

Grouping corresponding separately-generated sets of input data in chronological order so as to provide a single set of input data that can be interpreted in a time-coherent manner;

Filtering said single set of time-aligned input data and calculating meaningful features for gesture recognition;

Performing a continuous recognition of multi-touch gestures that allows users to start interacting with one multi-gesture and subsequently perform any other multi-touch gestures, if they want it, without needing to lift all their fingers off the multi-touch input device between each multi-touch gesture;

Performing at least one action during the user interaction sequence when a subset of input data is classified as a gesture.

11. The method of claim **10**, wherein the said multi-touch input device can be any combination of hardware, software and telecommunications.

12. The method of claim **10**, wherein input data is at least a list of contact points on said multi-touch input device.

13. The method of claim **12**, wherein a contact point can be a physical object, a finger, or any human body parts.

14. The method of claim **10**, wherein the said filtering input data step comprises a spatial segmentation method defined by the steps of: