contour to the left hand cluster and contacts to the right of a contour to the right hand cluster.

74. The method of claim 73, wherein the hand assignments of previously identified contacts can be locked so to not depend on which side of the dividing contour the contacts lie, while assignments of new contacts still depend on which side of the contour they lie.

75. The method of claim 69, wherein each attractor ring is translated, scaled and/or rotated to match previous position estimates for the hand corresponding to the attractor ring.

76. The method of claim 69, wherein the attractor points within each ring are individually offset by previously estimated finger offsets.

77. The method of claim 69, wherein the assignment fitness measure is a total cost computed as a weighted sum of distances from each contact to its assigned attractor point in the attractor ring of its assigned hand cluster, and wherein the best partition is the one with the lowest total cost.

78. The method of claim 77, wherein the distances between each surface contact and each attractor point are weighted according to how closely measured contact features, such as proximity to the surface, shape, size, eccentricity, orientation, distance to nearest neighbor contact, and velocity, match features typical of the hand part the attractor point represents.

79. The method of claim 77, wherein a separation between the innermost finger and the next innermost finger is compared with a separation between the outermost finger and next outermost finger to obtain a handedness weighting which increases the total cost for a hand as the outermost separation becomes larger than is biomechanically consistent.

80. The method of claim 77, wherein a hand portion of the total cost is decreased by a cluster velocity weighting function when the average velocity of the contact cluster of the hand indicates the hand is returning to its associated side of the surface.

81. The method of claim 77, wherein a hand portion of the total cost is increased by a palm cohesion weighting function when the contacts assigned to the palms of a hand are scattered over an area larger than the anatomical size of an outstretched palm.

82. The method of claim 77, wherein the total cost of a partition is increased by a interhand separation weighting when the measured separation between contacts tentatively assigned to opposite hand clusters indicates that the hands may be overlapping or close to touching.

83. A method for integrally extracting multiple degrees of freedom of hand motion from sliding motions of two or more fingers of a hand across a multi-touch surface, one of the fingers preferably being the opposable thumb, the method comprising the steps of:

tracking across successive scans of the proximity sensor array the trajectories of individual hand parts on the surface;

finding an innermost and an outermost finger contact from contacts identified as fingers on the given hand;

computing a scaling velocity component from a change in a distance between the innermost and outermost finger contacts;

computing a rotational velocity component from a change in a vector angle between the innermost and outermost finger contacts;

computing a translation weighting for each contacting finger;

computing translational velocity components in two dimensions from a translation weighted average of the finger velocities tangential to surface;

suppressively filtering components whose speeds are consistently lower than the fastest components;

transmitting the filtered velocity components as control signals to an electronic or electro-mechanical device.

84. The method of claim 83, wherein the scaling velocity computed from a change in distance between the innermost and outermost finger contacts is supplemented with a measure of scaling velocity selective for symmetric scaling about a fixed point between the thumb and other fingers.

85. The method of claim 83, wherein the rotational velocity computed from a change in vector angle between the innermost and outermost finger contacts is supplemented with a measure of rotational velocity selective for symmetric rotational about a fixed point between the thumb and other fingers.

86. The method of claim 83, wherein the translation weightings of the innermost and outermost fingers are constant but the translation weightings of central fingers are inversely related to polar component speeds so as to prevent vertical translation bias while performing hand scaling and rotation but otherwise include all available fingers in the translation average.

87. The method of claim 83, wherein the translational weightings are related to the ratio of each finger's speed to the speed of the fastest finger so that if the user chooses to move fewer fingers than are on the surface the gain between individual finger motion and cursor motion does not decrease.

88. The method of claim 83, wherein the suppressive filtering step comprises the following two sub steps:

downscaling each velocity component in proportion to a function of its average speed compared to the other average component speeds;

dead-zone filtering each downscaled velocity component wherein the width of the dead-zone depends on the distribution of the current component speeds.

89. The method of claim 83, wherein the orientation of an ellipse fitted to the thumb contact after each successive sensor array scan is transmitted as an additional degree of freedom control signal.

90. A method for integrally extracting roll and tilt degrees of freedom of hand motion from pressure changes of three or more non-collinear hand contacts comprising any of thumbs, fingertips or palms, the method comprising the steps of:

tracking across successive proximity images the trajectories of individual hand parts on the surface;

measuring proximities from each hand contact in a calibration proximity image once all available hand contacts have been stabilized;