software determines the position of eyebrows, lips, hands, fingers and any other features needed for the game. If necessary, specialized targets can be used as disclosed herein and elsewhere to augment this discrimination, for example such as optically contrasting nail polish, lipstick, eyeliner or other. Contrast can be in a color sense, or in a reflectivity sense such as even retro-reflective materials such as Scotchlite 7615 by 3M company. Even special targets can be used to enhance expressions if desired.

This can be a fun type game, as the response of the displayed person can be all kinds of things even contrary to the actual gestures if desired. Sounds, such as from speaker **1530** can also be added. And voice recognition of players words sensed by microphone **1550** can also be used, if verbal as well as expressive flirting is used.

While the game here has been illustrated in a popular flirting context, it is more generally described as a gesture based game. It can also be done with another contestant acting as the other player. And For example, the contestants can be spaced by the communication medium of the internet. The displayed characters on the screen (of the other player) can be real, or representations whose expressions and movements change due to sensed data from the player, transmitted in vector or other form to minimize communication bandwidth if desired.

Other games of interest might be:

- "Down on the Farm" in which a farmer with live animals is displayed on a life size screen, and the children playing the game are to help the farmer by calling the animals to come over to them. This would use recognition of voice and gesture to make the animal images move and make sounds.
- A player can find someone in a display and point at him, like the "Whereas Waldo" puzzle game. Then the subject moves, child runs to peek at him, and to find him, say running down a street whose image is displayed on the screen.

One can also use the camera of the invention to monitor the progress made by a child building blocks, and show an Video displayed image of a real skyscraper progressing as he builds his little version. Note the benefit of group activity like a board game and children's play with each other.

FIG. **16**

FIG. **16** illustrates a version of the pixel addressing camera technique wherein two lines on either side of a **1000** element square array are designated as perimeter fence lines to initiate tracking or other action.

Some "pixel addressing" cameras such as the IVP MAPP 2500 512×512 element camera, are smart, that is can process on the same chip. However, in some cases the control of such a camera may not allow one to actually read just one pixel, say, but rather one must read the whole line on which the pixel rests. Now some processing can be in parallel such that no speed is lost, at least in many instances.

If however, one does have to read a whole line serially into a computer portion, then to fully see a 10×10 pixel round target say, one would have to read at least 10 lines.

If two targets both were located on the same lines, the time involved to read would be the same.

In the same vein, if lines of data must be scanned, then the approach of 2b wherein every 20^{th} pixel say is interrogated can be specialized to having such pixels fall on scan lines wherever possible. And where one is restricted to reading all pixels on a scan line and where a target entry zone is anticipated, one can have a scan line oriented to be crossed by such entry. For example in FIG. **16**, the two lines **1601** (line of pixels **3**) and **1602** (line of pixels **997**) of a 1000×1000 element pixel array **1610** are designated as perimeter fence lines, to trigger a target tracking or other function on the entry of a target image on to the array, such as **1615** from either the right or left side in the drawing. This is often the case where entry from top or bottom is precluded by constraints of the application, such as a table top at the bottom, or the height of a person at the top. Or in a stereo example such as FIG. **6**, the baseline defines the direction of excursion of a target as z is varied again calling for crossing of scan lines out of the plane of the paper at some point.

The invention herein has provided an exciting method by which common board games can become more fun. The invention provides a link with that past, as well as all of the benefits of the video and computer revolution, also via the internet.

It is envisioned that the same approach may be applied to many card games as well. It is also thought that the invention will find use in creating ones own games, or in downloading from the internet others creations. For example, common everyday objects can become the tokens of the games, and taught to the game computer by presenting them to the video camera. Similarly, the people playing the game can be taught, including their names and interests.

FIG. **17**

FIG. **17** illustrates a 3D acoustic imaging embodiment of the invention which at low cost may generate accurate 3D images of the insides of objects, when used in conjunction with ultrasonic transducers and particularly a matrix array of ultrasonic transducers.

As shown in FIG. **17**A, the position in xyz of the ultrasonic imaging head **1700** on wand **1701** held in a users hand **1702** is monitored electro-optically as taught in FIG. **1**, using a single camera **1710** and a simple four dot target set **1715** on the head **1700** at the end of the transducer wand **1701** in contact with the object to be examined **1720**. Alternatively, as also taught in FIG. **1**, a stereo pair for example providing higher resolution in angle can be employed.

Computer **1725** combines ultrasonic ranging data from the ultrasound transducer head **1700** and from the sensor of transducer location (in this case performed optically by camera **1710** using the optically visible targets on the transducer head) in order to create a range image of the internal body of the object **1720** which is thus referenced accurately in space to the external coordinate system in the is case represented by the camera co-ordinates xy in the plane of the TV camera scan, and z in the optical axis of the camera.

In many cases it is also desirable to know the pointing angles of the transducer. One instance is where it is not possible to see the transducer itself due to obscuration, in which case the target may alternately be located at the end **1704** of the wand for example. Here the position and orientation of the wand is determined from the target data, and the known length of the wand to the tip is used, with the determined pointing angle in pitch and yaw (obtained from the foreshortening of the target spacings in the camera image field) to calculate the tip position in space.

This pitch and yaw determination also has another use however, and that is to determine any adjustments that need to be made in the ultrasonic transduction parameters or to the data obtained, realizing that the direction of ultrasound propagation from the transducer is also in the pointing direction. And that the variation in ultrasound response may be very dependent on the relation of this direction **1730** with respect