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EXAMINER	
BAINS, SARJIT S	
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3624	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	**Application No.** 14/963,502	**Applicant(s)** IMAZAWA et al.	
	Examiner SARJIT S BAINS	**Art Unit** 3624	**AIA (FITF) Status** Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☑ Responsive to communication(s) filed on 04/09/2019.
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL**. 2b) ☑ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5) ☑ Claim(s) 1,3 and 7-9 is/are pending in the application.
5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6) ☐ Claim(s) _____ is/are allowed.

7) ☑ Claim(s) 1,3 and 7-9 is/are rejected.

8) ☐ Claim(s) _____ is/are objected to.

9) ☐ Claim(s) _____ are subject to restriction and/or election requirement

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to **PPHfeedback@uspto.gov.**

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.
2.☐ Certified copies of the priority documents have been received in Application No. _____.
3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☑ Notice of References Cited (PTO-892)

2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b)
Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.

4) ☐ Other: _____.

Notice of Pre-AIA or AIA Status

1. The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

Notice to Applicant

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 04/09/2019 has been entered.

3. The following is a non-Final Office Action. In response to Examiner's Final Rejection of 02/08/2019, Applicant, on 04/09/2019, amended Claim 1, and added new Claims 7-9; Claim 3 is as previously presented; Claims 2 and 4-6 were previously canceled.

Claims 1, 3 and 7-9 are pending in this application and have been rejected below.

Response to Amendment

4. Applicant’s arguments and amendments are acknowledged.

5. The prior 35 USC §101 rejection maintained despite Applicant's amendments and arguments.

6. The prior 35 USC §103 rejection withdrawn, and new 35 USC §103 rejection added in light of Applicant's amendments.

Claim Rejections - 35 USC § 101

7. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

8. Claims 1, 3 and 7-9 rejected under 35 U.S.C. 101 because, although they are drawn to a statutory category of method (process), they are also directed to a judicial exception (an abstract idea) without significantly more.

9. Claim 1 recites a prediction model construction step of acquiring a prediction model that is statistically constructed from past worker path data, including x-coordinates and y-coordinates of a center of gravity, a position of a head and a position of a joint of at least one past worker over at least one past path during at least one past work, past intermediate quality data of the at least one past work, and past final quality data of the at least one past work; an image data acquisition step of acquiring image data in which the target worker is captured performing the work, the image data including a plurality of frames; a worker position recognition step of recognizing a plurality of positions of the target worker, including x-coordinates and y-coordinates of a center of gravity, a position of a head and a position of a joint of the target worker during target work, from the image data; and an unusual worker position determining step of substituting the positions of the target worker recognized in the worker position recognition step into the prediction model to estimate a path of the target worker based on the plurality of positions of the target worker, to calculate a difference between data on the estimated path and preset normal path data of the target worker, to compare the calculated difference with a path threshold value that is preset, and, based on the

comparison, to determine whether the estimated path of the target worker is a usual path or an unusual path, which is modeling and therefore an abstract idea of Mental Processes - concepts performed in the human mind (including an observation, evaluation, judgment, opinion).

The judicial exception is not integrated into a practical application because the claims, including additional elements such as A method for work quality control of a target worker in work where repetitive operation is performed, are not an improvement to a computer or a technology, the claims do not apply the judicial exception with a particular machine, the claims do not effect a transformation or reduction of a particular article to a different state or thing, nor do the claims apply the judicial exception in some other meaningful way beyond generally linking the use of the judicial exception to a particular technological environment such that the claims as a whole are more than a drafting effort designed to monopolize the exception.

The claims do not include additional elements that are sufficient to amount to significantly more than the judicial exception (abstract idea), because these additional elements such as those listed above, individually or in combination, do not recite anything that is beyond conventional and routine use of computers (as evidenced by page 5, line 31of the Specification in the instant Application, or are merely for data gathering and data transformation.

Dependent Claims 3 and 7-9 also do not include additional elements that are sufficient to amount to significantly more than the judicial exception (abstract idea), because these additional elements, considered either individually or in combination, are merely extensions of the abstract idea, or merely indicate a field of use or technological environment (see MPEP 2106.05(h)). The claims therefore fail to apply the judicial exception in a meaningful way that provides an inventive concept so as to transform the claims into patent-eligible subject matter (see MPEP 2106.05(e)).

Therefore, Claims 1, 3 and 7-9 are rejected under 35 U.S.C. 101 as being directed to non-eligible subject matter. See Alice Corp. v. CLS Bank International, 573__ U.S. 2014.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103:

A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

35 U.S.C. 103 forms the basis for all obviousness rejections set forth in this Office action.

11. Claims 1 and 3 rejected under 35 U.S.C. 103 as being unpatentable over Matsunaga (US Patent Application Publication 20150131856 A1 - hereinafter Matsunaga) in view of Haering et al. (US Patent Application Publication 2008/0166015 A1 - hereinafter Haering) in view of Okamoto et al. (US Patent Application Publication 20060111811 A1 - hereinafter Okamoto) in view of Hon (PCT International Application Publication WO 2010123342 A2 - hereinafter Hon).

12. As per Claim 1, Matsunaga teaches:

A method for work quality control of a target worker in work where repetitive operation is performed **[reads on: Abstract, "A monitoring device configured to monitor whether a look of a target person is in a proper state suitable for a working environment"]**, *the method comprising: ...*

... from past worker path data **[reads on: Fig. 4, areas A, B, C; para 36, "It is conceivable that the identical worker performs each work while moving among the working areas A to C."]**, *...*

... a position of a head and a position of a joint of at least one past worker over at least one past path during at least one past work **[reads on: Fig. 1, Hand detector 1111; para 24, "The hand detector 111 is a function of analyzing the taken-in image to detect a hand region (for example, a region from a wrist to a fingertip). .. Examples of the hand detection processing include a method for detecting a face or a head from the image to identify the hand region from a relative position relationship based on a human body model and a method for recognizing a shape of a finger of the hand by pattern recognition or model fitting."]**, *past intermediate quality data of the at least one past work, and past final quality data of the at least one past work* **[reads on: para 60, "For example, in the case that the worker handles a dangerous article or in the case that the worker performs the work in a dangerous zone, the worker is required to protect a head or eyes of the worker. In the case that the worker handles a sanitary control article such as the food, the worker is required to wear a mask or cap. Accordingly, the state of the head or a facial part (such as eyes, a nose, and a mouth) is estimated from the image, whether the worker wears the necessary object such as a helmet, a cap, a goggle, and a mask may be monitored"]**; *an image data acquisition step of acquiring image data in which the target worker is captured performing the work* **[reads on: Fig. 1, camera 10, Image input unit 110; para 22, "A camera 10 is an imaging instrument that captures an image of a worker 13 to take the acquired image data in the monitoring device 11."; para 24, "Any technology is applied to hand detection processing. Examples of the hand detection processing include a method for detecting a face or a head from the image to identify the hand region from a relative position relationship based on a human body model and a method for recognizing a shape of a finger of the hand by pattern recognition or model fitting."; para 29, "The hand state estimator 112 analyzes the image of the hand region detected in Step S31, and determines whether the worker 13 wears the gloves or is barehanded."; para 42, "The proper state acquisition unit 113 reads the proper state information**

associated with the working area B from the storage 114 (Step S64)."; para 67, "The proper state acquisition unit may be configured to read the proper state information to be compared to the estimation result of the state estimator from a storage in which the proper state information expressing the proper state of the predetermined region is previously set."], *the image data including a plurality of frames* **[reads on: Fig. 8, Generate partial image associated with each working area S81]**; *a worker position recognition step of recognizing a plurality of positions of the target worker* **[reads on: para 46, "FIG. 7 illustrates an example of the image taken from the camera 10. It is assumed that the image of the working area A is captured in a block 70A of the image, that the image of the working area B is captured in a block 708, and that the image of the working area C is captured in a block70C."]**, ...

... a position of a head and a position of a joint of the target worker during target work, from the image data **[reads on: Fig. 1, para 24, as above]**; *and ...*

Matsunaga does not explicitly teach, but Haering teaches:

... a prediction model construction step of acquiring a prediction model that is statistically constructed **[reads on: para 6, "The contextual information may be gathered in the form of statistical models representing the expected behavior of targets."]** ...

... an unusual worker position determining step of substituting the positions of the target worker recognized in the worker position recognition step into the prediction model **[reads on: Fig. 1, Path Builder 16; Fig. 6, Target Behavior Analyzer 608, Alert Generator 610; para 60, "A target behavior analyzer 608 may analyze and identify behavior of later detected targets 604 with respect to the mature path model 606. An alert generator 610 may receive the results of the analysis and may generate an alert 612 when a specified behavior is detected and identified."]** *to estimate a path of the target worker based on the plurality of positions of the target worker* **[reads on: para 32, "A "target property map" may refer to a mapping of target properties or functions of target properties to image locations. Target**

property maps are built by recording and modeling a target property or function of one or more target properties at each image location. For instance, a width model at image location (x,y) may be obtained by recording the widths of all targets that pass through the pixel at location (x,y)."], ...

... *to determine whether the estimated path of the target worker is a usual path or an unusual path* **[reads on: para 7, "The mature path models may be used to identify whether a target's behavior is consistent with respect to the expected target behavior, to predict a target's subsequent path based on the target's observed behavior and to classify a target's type."; para 73, "Path models may also allow detection of unusual target properties and/or behavior, such as, for example, when a target deviates from its path. For instance, information about a target's deviation from a path may help to detect targets that travel in parts of the scene not associated with any known path, or to detect targets that enter the scene outside known entry points/regions and/or known exit points/regions."; para 74, "Deviation from a path may also be determined by detection of a failure to arrive on time or at the desired location."; para 86, "One or more detected unusual target behaviors may be combined, or with target behaviors detected in the context of a statistical model to detect unusual co-occurrences. For instance, surveillance applications may use information of a detected site access with detection of an un-manned guard post to detect an unauthorized access."]**.

At the time of filing, it would have been obvious to a person of ordinary skill in the art to have modified Matsunaga to incorporate the teachings of Haering in the same field of endeavor of image analysis to include a prediction model construction step of acquiring a prediction model that is statistically constructed, an unusual worker position determining step of substituting the positions of the target worker recognized in the worker position recognition step into the prediction model to estimate a path of the target worker based on the plurality of positions of the target worker, to determine whether the estimated path of the target worker is a usual path or an unusual path. The motivation for doing this would have been to improve the image analysis of Matsunaga by efficiently detecting anomalies. See Haering, Abstract, "A system for detecting behavior of a target may include: a target detection engine, adapted to detect at least one target from one or more objects from a video surveillance system recording a scene; a path builder, adapted to create at least one mature path model from analysis of the behavior of a plurality of targets in the scene, wherein the at least one mature path model includes a model of expected target behavior with respect to the at least one path model; and a target behavior analyzer, adapted to analyze and identify target behavior with respect to the at least one mature path model. The system may further include an alert generator, adapted to generate an alert based on the identified behavior.".

Matsunaga in view of Haering does not explicitly teach, but Okamoto teaches:

... *including x-coordinates and y-coordinates of a center of gravity* **[reads on: para 185, "In the example of FIG. 6, the location data is expressed by six parameters, including three parameters (x1, y1, z1) for determining the location of an article (e.g., location of the center of gravity) and three parameters (l1, m1, n1) for determining the direction of an article, although the location data can have various expressions. The handler is a mobile existence specified by the handler specifying section 32."]**, ...

... *including x-coordinates and y-coordinates of a center of gravity* **[para 185, as above]**, ...

At the time of filing, it would have been obvious to a person of ordinary skill in the art to have modified Matsunaga in view of Haering to incorporate the teachings of Okamoto in the same field of endeavor of image analysis to include including x-coordinates and y-coordinates of a center of gravity. The motivation for doing this would have been to improve the image analysis of Matsunaga in view of Haering by efficiently detecting locations. See Okamoto, Abstract, "A sensing unit, such as a camera, or the like, senses the conditions of articles and mobile existences, including humans, in a life space, such as a house of a household, or the like."; Fig. 1, Sensing unit 1, Full-time update of conditions in space.

Matsunaga in view of Haering in view of Okamoto does not explicitly teach, but Hon teaches:

... to calculate a difference between data on the estimated path and preset normal path data of the target worker, to compare the calculated difference with a path threshold value that is preset, and, based on the comparison **[HON reads on: Fig. 4, Fig. 10, distance to standard path; Fig. 6(a), Fig. 6(b), Likelihood to come back to the standard path; Fig. 12, Threshold value; p.3, lines 6-24, "A general overview of the exemplary method to generate the Analytical Path Deviation Model can been seen from Figure· 1. It is an aspect of the present invention to generate a model that is able to calculate the probability of a mobile object to deviate from a standard path. .. The present Analytical Path Deviation Model takes into consideration a few criteria when computing the probability value. The criteria are: a. The instantaneous distance between the object and the outmost pixel of the standard path"; p. 8, line 22 - p. 9, line 6 "The security alarm is triggered when the reasoning value· of the. semantic interpretation stage reaches or exceeds the predetermined threshold value. .. The value is predetermined by the user. Threshold value can be set high or low depending on the sensitivity level of an area. An example of threshold value can be seen in Figure 12 .. Figure 13 (b) illustrates a graph indicating the probability of deviation of an object in the area based over time and the threshold value."]**, ...

At the time of filing, it would have been obvious to a person of ordinary skill in the art to have modified Matsunaga in view of Haering in view of Okamoto to incorporate the teachings of Hon in the same field of endeavor of image analysis to include to calculate a difference between data on the estimated path and preset normal path data of the target worker, to compare the calculated difference with a path threshold value that is preset, and, based on the comparison. The motivation for doing this would have been to improve the image analysis of Matsunaga in view of Haering in view of Okamoto by efficiently detecting deviations from a path. See Hon, p. 6, lines 2-4 "Sliding windows are defined as a user-determined number of consecutive video frames of the surveillance video that is used for calculating the probability of the mobile objects deviation from the standard path.".

13. Claim 2 canceled.

14. As per Claim 3, Matsunaga in view of Haering in view of Okamoto in view of Hon teaches:

The method for work quality control according to claim 1 **[as above]**, *wherein*

Matsunaga further teaches:

... and further comprising: a step of displaying the unusualness degree **[reads on: Fig. 1, Output device 12; para 22, "The output device 12 outputs a determination result to the worker 13. For example, a display device that outputs the determination result through characters or images and a speaker that outputs sound or a warning tone can be used as the output device 12 in order to make a notification whether a look of the worker 13 is proper."]**.

Matsunaga does not explicitly teach, but Haering further teaches:

the determination of unusualness is performed using an unusualness degree **[reads on: para 71, "Gathering statistical data of target behavior on a path may provide a range of, for example, normal driving regions, directions, object entry and exit probabilities."; para 80, "Information about a target traveling on a path, but at an unusual time, may help to detect, for example, unauthorized access to a closed facility at nighttime, even if the same facility is accessible by day. This information may also allow the comparison of current target behavior with access patterns normal for a particular time of day to detect potential trespassers."; para 90, "The context of a target may be updated by recording the degree of its conformance with the target property map maintained by this algorithm."]**, ...

At the time of filing, it would have been obvious to a person of ordinary skill in the art to have modified Matsunaga in view of Haering in view of Okamoto in view of Hon to incorporate the further teachings of Haering in the same field of endeavor of image analysis to include the determination of unusualness is performed using an unusualness degree. The motivation for doing this would have been to improve the image analysis of Matsunaga in view of Haering in view of Okamoto in view of Hon by efficiently detecting anomalies.

15. Claims 4-6 canceled.

16. Claims 7-9 rejected under 35 U.S.C. 103 as being unpatentable over Matsunaga in view of Haering in view of Okamoto in view of Hon (PCT International Application Publication WO 2010123342 A2 - hereinafter Hon) in view of Davidson (US Patent Application Publication 20130030873 A1 - hereinafter Davidson).

17. As per Claim 7, Matsunaga in view of Haering in view of Okamoto in view of Hon teaches:

The method for work quality control according to claim 1 **[as above]**, *further comprising*

Matsunaga in view of Haering in view of Okamoto in view of Hon does not explicitly teach, but Davidson teaches:

a work start recognition step of recognizing from the acquired image data whether a work item has been started; a work end recognition step of determining whether the work item has been ended based on the acquired image data ; and an unusual work time period detection step of acquiring a work time period from a difference between a work start time point recognized in the work start recognition step and a work end time point recognized in the work end recognition step **[reads on: para 205, "For example,**

FIG. 16 shows an employee timecard view 800B of the central server user interface 800 according to one embodiment. In the illustrated embodiment, the employee timecard view 800B displays a stop-by-stop information table 1351, which indicates some or all of the following for each stop performed by the selected driver in unique information columns: the stop number (e.g., 1, 2, 3), the type of stop--indicated as "Type" (e.g., delivery or "DL," pickup or "PU," return to building or "RTB"), the distance in miles from the previous stop--indicated as miles-to-stop or "MTS" (e.g., 18.5 miles), the time when the driver begins the stop--indicated as "Stop Start" (e.g., 10:44:00), the time when the driver completes the stop--indicated as "Start Finish" (e.g., 10:54:00), the total time elapsed while executing the stop--indicated as "Stop Time" (e.g., 10.00 minutes), the time elapsed traveling from the previous stop--indicated as time-to-stop or "TTS" (e.g., 74.00 minutes), the total time elapsed traveling from the previous stop and executing the current stop--indicated as "Total Time" (e.g., 84.00 minutes), the amount of time the driver was on the property of a shipping hub during the time-to-stop period--indicated as "On Property" (e.g., 23.63 minutes), the amount of non-travel time to stop occurring between the completion of the previous stop and the beginning of the current stop--indicated as "Non-Travel TTS" (e.g., 5.85 minutes), the amount of pure travel time occurring between the completion of the previous stop and the beginning of the current stop--indicated as "Pure Travel" (e.g., 45.37 minutes), the amount of lunch time occurring between the completion of the previous stop and beginning of the current stop--indicated as "Lunch" (e.g., 30.00 minutes), the amount of driver-coded delay time occurring between the completion of the previous stop and the beginning of the current stop--indicated as "Coded Delay" (e.g., 1.50 minutes), .."; para 227, "In addition, in one embodiment, the employee Gantt module 1400 presents identified Start of Trip, Travel, and End of Trip segments in the "Travel" activity row of the Gantt chart 1452, the Start of Trip and End of Trip segments flanking each Travel segment. .. Further, in one embodiment, the employee Gantt module 1400 calculates the duration of each represented activity segment and displays the duration within the activity segment block (where the Gantt chart's resolution permits)."; para

230, "The vehicle position indicator 1465 comprises an image of a truck positioned adjacent a highlighted point along the vehicle path plotted in step 1406."], *comparing the acquired work time period with a work time threshold value that is preset, and, based on the comparison, determining whether the acquired work time period is a usual work time period or an unusual work time period* **[reads on: para 298, "Next, at step 1908, the location hours module 1900 determines and displays the geofence on property time and actual on property time for the current driver on the user-selected date."; para 299, "Next, at step 1912, the location hours module 1900 determines and displays the difference between the geofence on property time and actual on property time determined in step 1908 for the current driver."; para 300, "Next, at step 1916, the location hours module 1900 determines the excess on property time for the current driver by subtracting the planned on property time retrieved in step 1914 from the actual on property time determined in step 1908."; para 301, "Next, at step 1920, the location hours module 1900 determines the total non-travel time to stop time, delay code time, and lunch time for the current driver on the user-selected date."]**.

At the time of filing, it would have been obvious to a person of ordinary skill in the art to have modified Matsunaga in view of Haering in view of Okamoto in view of Hon to incorporate the teachings of Davidson in the same field of endeavor of operations analysis to include a work start recognition step of recognizing from the acquired image data whether a work item has been started; a work end recognition step of determining whether the work item has been ended based on the acquired image data ; and an unusual work time period detection step of acquiring a work time period from a difference between a work start time point recognized in the work start recognition step and a work end time point recognized in the work end recognition step, comparing the acquired work time period with a work time threshold value that is preset, and, based on the comparison, determining whether the acquired work time period is a usual work time period or an unusual work time period. The motivation for doing this would have been to improve the operations analysis of Matsunaga in view of Haering in view of Okamoto in view of Hon by efficiently monitoring operations. See Davidson, Abstract, "Various embodiments of the present invention are directed to an asset management computer system for assessing operational data indicative of the movement of one or more mobile assets within a work environment.".

18. As per Claim 8, Matsunaga in view of Haering in view of Okamoto in view of Hon in view of Davidson teaches:

The method for work quality control according to claim 7 **[as above]**, *further comprising:*

Matsunaga in view of Haering in view of Okamoto in view of Hon does not explicitly teach, but Davidson further teaches:

defining a difference between the acquired work time period and the threshold value as an unusualness degree; wherein the acquired work time period is a usual work time period if the unusualness degree is less than a certain value and the acquired work time period is an unusual work time period if the unusualness degree is greater than the certain value **[reads on: para 402, "For example, in certain embodiments, the central server 120 may be configured to identify in-position segments and out-of-position segments. FIG. 54 illustrates steps executed by the central server according to a data segmenting module in order to identify such in-position and out-of-position segments. .. Each identified in-position segment is then stored as a unique in-position segment and stored in the central server's database along with its operational characteristics, which may include a description of the position segment (e.g., "in-position"), duration (e.g., 58 seconds), location (e.g., location coordinates), and time (e.g., 9:25 AM)."; para 403, "Next, at step 5006, the central server 120 identifies all out-of-position segments indicated by the operational data."; para 405, "FIG. 55 illustrates an exemplary Gantt chart showing in-position and out-of-position segments for a particular mobile asset. As will be appreciated from FIG. 55, the ability to easily identify and review in- and out-of-position segments can be advantageous in assessing mobile asset efficiencies. For example, where a particular mobile asset has a higher cumulative period of out-of -position time than peer employees, this data may be**

indicative of inefficiencies (e.g., behavioral inefficiencies on the part of an employee, mishandling of a package, etc.)."; para 407, "For example, similarly to the fleet management system 5 described above, the central server may be configured to generate various cumulative or individual statistics for one or more mobile assets, including: a chronological listing of position segments for a mobile assets indicating the time of occurrence, duration, and position of the mobile asset for each position segment; the cumulative duration of all in-position segments for one more mobile assets; the cumulative duration of all out-of-position segments for one or more mobile assets; the percentage of out-of-position time for one or more mobile assets; a listing of the longest out-of-position segments according to percentage (e.g., top 10% longest out-of-position segments) or other threshold (e.g., all out-of-position segments longer than 15 minutes)."].

At the time of filing, it would have been obvious to a person of ordinary skill in the art to have modified Matsunaga in view of Haering in view of Okamoto in view of Hon in view of Davidson to incorporate the further teachings of Davidson in the same field of endeavor of operations analysis to include defining a difference between the acquired work time period and the threshold value as an unusualness degree; wherein the acquired work time period is a usual work time period if the unusualness degree is less than a certain value and the acquired work time period is an unusual work time period if the unusualness degree is greater than the certain value. The motivation for doing this would have been to improve the operations analysis of Matsunaga in view of Haering in view of Okamoto in view of Hon in view of Davidson by efficiently monitoring operations.

19. As per Claim 9, Matsunaga in view of Haering in view of Okamoto in view of Hon in view of Davidson teaches:

The method for work quality control according to claim 7, wherein the whether the work item has been started **[as above]** *is ...*

... *wherein the whether the work item has been ended* **[as above, Claim 7]** *is ...*

Matsunaga in view of Haering in view of Okamoto does not explicitly teach, but Hon further teaches:

determined from transition of feature quantities of individual images in a plurality of frames of past images **[reads on: p. 3, lines 14-17 "The intention of the mobile object i.e. whether the object is about commit a suspicious act or not can be analytically interpreted by analyzing the deviation probability valued obtained over a plurality of frames. In other words, a conclusion on the objects intention is drawn based on its moving pattern history."; p. 6, lines 2-4 "Sliding windows are defined as a user-determined number of consecutive video frames of the surveillance video that is used for calculating the probability of the mobile objects deviation from the standard path."]***; and ...*

... determined from the transition of feature quantities of individual images in the plurality of frames of past images **[as above]**.

At the time of filing, it would have been obvious to a person of ordinary skill in the art to have modified Matsunaga in view of Haering in view of Okamoto in view of Hon in view of Davidson to incorporate the further teachings of Hon in the same field of endeavor of operations analysis to include (work item) determined from transition of feature quantities of individual images in a plurality of frames of past images. The motivation for doing this would have been to improve the operations analysis of Matsunaga in view of Haering in view of Okamoto in view of Hon in view of Davidson by efficiently monitoring operations.

Response to Arguments

20. Applicant's arguments filed 04/09/2019 have been fully considered, but they are found unpersuasive or are moot in light of the new rejections necessitated by the amendments.

21. Applicant's arguments with regard to the 103 rejection (at pp. 6-7) are moot in light of the new references used for the rejection of the amended claim language in Claim 1 and new Claims 7-9.

22. Applicant argues (at pp. 8-10) that, by analogy with *Finjan*, the claims are not directed to an abstract idea, but "are non-abstract and represent a practical application of the idea to solve a technical problem", and are thus eligible under 35 U.S.C. 101 at step 2A of the *Alice* framework.

Examiner respectfully disagrees. At step 2A, the claimed invention recites an abstract idea of modeling a business process (Mental Processes) at Prong 1 of the 2019 PEG, and provides no additional elements that might create an improvement to a technology at Prong 2 of the analysis, as explained at paragraph 9 above in this Office Action.

23. Applicant further argues (at pp. 10-12) that "At a minimum, claim 1 recites a combination of steps to gather data, use the data to estimate a path, and determine whether the estimated path is a usual path or an unusual path in an unconventional way and thus includes an inventive concept" at step 2B of the *Alice* framework.

Examiner respectfully disagrees with Applicant's assertion, since the claim is clearly directed to an abstract idea. Novelty does not necessarily equate with patent-eligibility, as pointed out by the Court in *Ultramercial, Inc. v. Hulu, LLC,* 772 F.3d 709, 714-15 (Fed. Cir. 2014) ("According to Ultramercial, abstract ideas remain patent-eligible under § 101 as long as they are new ideas, not previously well known, and not routine activity. ... We do not agree with Ultramercial that the addition of merely novel or non-routine components to the claimed idea necessarily turns an abstraction into something concrete."

Conclusion

24. Applicant's amendment necessitated any new ground(s) of rejection presented in this Office Action. See MPEP §706.07(a).

25. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Malik et al. (US Patent Application Publication 20100302041 A1) describes a method and system for monitoring patterns of motion, comparing to a baseline to determine a difference, and comparing the difference to a threshold.

Issing et al. (US Patent Application Publication 20140083058 A1) describes a storage and order-picking system for storing and picking piece goods, including a motion-sensor system, which detects motions, preferably of the hands and/or forearms, of the operator within the working area of the work station and which converts same into corresponding motion signals.

Sahadeo et al. (US Patent Application Publication 20140232828 A1) describes a method and system for monitoring work processes. Once example computer-implemented method includes recording a three-dimensional work trajectory. The work trajectory comprises a representation of the actual motion of one or more markers. The method further includes comparing the work trajectory to a work template. The work template comprises a representation of the desired motion of the one or more markers.

Sugihara et al. (US Patent Application Publication 20150167461 A1) describes a method and system for detecting and accumulating data for the position and operation of a mining machine, in order to detect anomalies.

26. Any inquiry concerning this communication or earlier communications from the examiner should be directed to SARJIT S BAINS whose telephone number is 571 270 0317. The examiner can normally be reached on Monday-Friday from 9:00 am to 5:30 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, ANITA Y. COUPE, can be reached on 571 270 3614. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://portal.uspto.gov/external/portal. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice .

/SARJIT S BAINS/
Examiner, Art Unit 3624

/SUJAY KONERU/
Primary Examiner, Art Unit 3624

REMARKS / ARGUMENTS

Claims 1, 3, 8, and 10-14 remain pending in this application. Claims 2, 4-7, and 9 have been canceled without prejudice and without disclaimer. Claim 1 and 8 have been amended. New claims 10-14 have been added. No new matter has been introduced.

35 U.S.C. §103

Claims 1 and 3 stand rejected under 35 U.S.C. §103 as being unpatentable over Matsunaga (U.S. Publication No. 2015/0131856; hereinafter "Matsunaga") in view of Haering et al. (U.S. Publication No. 2008/0166015; hereinafter "Haering") in view of Okamoto et al. (U.S. Publication No. 20060111811; hereinafter "Okamoto") in view of Hon (PCT International Application Publication WO 2010123342 A2; hereinafter "Hon"). **Claims 7-9** stand rejected under 35 U.S.C. §103 as being unpatentable over Matsunaga in view of Haering in view of Okamoto in view of Hon in view of Davidson (U.S. Publication No. 20130030873 A1).

Claims 1, 3, and 8

Applicants respectfully submit that independent claim 1 as amended is patentable over the cited references because, for instance, they do not teach or suggest an unusual work time period detection step of acquiring a work time period from a difference between a work start time point recognized in the work start recognition step and a work end time point recognized in the work end recognition step, wherein whether the work item has been started is determined from transition of feature quantities of individual images in a plurality of frames of past images, and wherein whether the work item has been ended is determined from the transition of feature quantities of individual images in the plurality of frames of past images.

The Office Action at page 19 cites Hon at page 3, lines 14-17, and at page 6, lines 2-4, for allegedly disclosing the features of determining whether the work item has been started from transition of feature quantities of individual images in a plurality of frames of past images, and determining whether the work item has been ended from the transition of feature quantities of individual images in the plurality of frames of past images.

Hon merely discloses, however, determining whether a mobile object is about to commit a suspicious act or not by analyzing the deviation probability value obtained over a plurality of frames; in other words, a conclusion on the object's intention is drawn based on its moving pattern history. Determining whether a mobile object is about to commit a suspicious act or not is <u>different</u> from determining whether the work item has been started and whether the work item has been added. Furthermore, making the determination based on the deviation probability value obtained over a plurality of frames is <u>different</u> from making the determination based on transition of feature quantities of individual images in a plurality of frames of past images.

For at least the foregoing reasons, claim 1, and claims 3 and 8 depending from, are patentable.

Claims 10-14

Applicants respectfully submit that new independent claim 10 is patentable over the cited references because, for instance, they do not teach or suggest an unusual work time period detection step of acquiring a work time period from a difference between a work start time point recognized in the work start recognition step and a work end time point recognized in the work end recognition step, wherein whether the work item has been started is determined from transition of feature quantities of individual images in a plurality of frames of past images, and wherein whether the work item has been ended is determined from the transition of feature quantities of individual images in the plurality of frames of past images.

As discussed above in connection with claim 1, Hon merely discloses determining whether a mobile object is about to commit a suspicious act or not by analyzing the deviation probability value obtained over a plurality of frames; in other words, a conclusion on the object's intention is drawn based on its moving pattern history. Determining whether a mobile object is about to commit a suspicious act or not is different from determining whether the work item has been started and whether the work item has been added. Furthermore, making the determination based on the deviation probability value obtained over a plurality of frames is different from making the determination based on transition of feature quantities of individual images in a plurality of frames of past images.

For at least the foregoing reasons, claim 10, and claims 11-14 depending from, are patentable.

Rejections Under 35 U.S.C. § 101

The Examiner has rejected claims 1, 3 and 7-9 under 35 U.S.C. § 101 because, although they are drawn to a statutory category of method (process), they are also directed to a judicial exception (an abstract idea) without significantly more. The rejection under 35 U.S.C. §101 contained in the Office Action lacks the following points of analysis required by the USPTO Guidelines.

1. Alice Test Step 2A requires analysis as to whether the claim, as a whole, is "directed to" as opposed to being merely "based on" the alleged abstract idea

Under Step 2A of the Alice test, each of independent claims 1 and 10, taken as a whole, is not directed to an abstract idea. It is not enough that a claim is based on an abstract idea. The focus is on whether the claim is "directed to" the ineligible concept rather than simply embodies, uses, or applies the concept. In other words, the first part of the Alice test is not whether an abstract idea can be found in the claim, but rather whether the claims are actually directed to the patent-ineligible concept.

Claims 1 and 10 each recite (1) acquiring a prediction model that is statistically constructed from past worker path data, including x-coordinates and y-coordinates of a center of gravity, a position of a head and a position of a joint of at least one past worker over at least one past path during at least one past work, past intermediate quality data of the at least one past work, and past final quality data of the at least one past work; (2) acquiring image data in which the target worker is captured performing the work, the image data including a plurality of frames; (3) a work start recognition step of recognizing from the acquired image data whether a work item has been started; (4) a work end recognition step of determining whether the work item has been ended based on the acquired image data; (5) an unusual work time period detection step of (5a) acquiring a work time period from a difference between a work start time point recognized in the work start recognition step and a work end time point recognized in the work end recognition step, (5b) comparing the acquired work time period with a work time threshold value that is preset, and, based on the comparison, (5c) determining whether the acquired work time period is a usual work time period or an unusual work time period; (6) wherein whether the work item has been started is determined from transition of feature quantities of individual images in a plurality of frames of past images; and (7) wherein whether the work item has been ended is determined from the transition of feature quantities of individual images in the plurality of frames of past images.

Claims 1 and 10 are each directed toward technical improvements over prior art. The specification at page 2, lines 22-25 states: "JP-A-2010-211626 describes a technique to acquire a path of a mobile object from captured-image data. However, the technique of JP-A-2010-211626 does not enable determination of whether the acquired path is a usual one or an unusual one. An objective of the present invention is to determine automatically whether a work status of each worker is a usual one or an unusual one, from images of a workplace that is characterized by repeating the same work." The specification at page 2, line 28 to page 3, line 4 states: "As representative means, there is a method of statistically modelling a relationship between position (main body position or joint position) data on a worker acquired from captured-image data and a quality check result and by substituting position data on a determination target or joint position data into a model, determining whether a path is a usual one or an unusual one. According to the present invention, in a workplace that is characterized by repeating the same work, it is possible to determine automatically whether a work status of each worker is a usual one or an unusual one."

Claims 1 and 10 each recite a technological solution to the technical problem in the prior art of how to determine automatically whether a work status of each worker is a usual one or an unusual one. The present invention accomplishes this in part by (3) a work start recognition step of recognizing from the acquired image data whether a work item has been started; (4) a work end recognition step of determining whether the work item has been ended based on the acquired image data; (5) an unusual work time period detection step of (5a) acquiring a work time period from a difference between a work start time point recognized in the work start recognition step and a work end time point recognized in the work end recognition step, (5b) comparing the acquired work time period with a work time threshold value that is preset, and, based on the comparison, (5c) determining whether the acquired work time period is a usual work time period or an unusual work time period; (6) wherein whether the work item has been started is determined from transition of feature quantities of individual images in a plurality of frames of past images; and (7) wherein whether the work item has been ended is determined from the transition of feature quantities of individual images in the plurality of frames of past images. The claimed invention uses computer analysis, calculation, and comparison to generate an unusualness degree, from transition of feature quantities of individual images in a plurality of frames of past images, and by comparing the unusualness degree with a preset threshold to determine whether unusualness has been reached or not. As such, claims 1 and 10 are not directed to an abstract idea, but are merely based on an alleged abstract idea. According to the USPTO Guidelines, this is sufficient to establish that claims 1 and 10 are patent eligible.

The claims are directed to nonabstract improvement in computer functionality, rather than the abstract idea of information collection, analysis, and calculation. The result is the ability to determine automatically whether a work status of each worker is a usual one or an unusual one in a workplace that is characterized by repeating the same work. See, e.g., *Finjan v. Blue Coat Systems*, 2016-250 (Fed. Cir. 2018). *Finjan* states at page 9: "There is no need to set forth a further inventive concept for implementing the invention." As such, the claims are nonabstract and represent a practical application of the idea to solve a technical problem.

2. <u>Alice Test Step 2B requires analysis as to whether the claim recites an element that is more than what is well-understood, routine, or conventional</u>

According to the USPTO Guidelines, an additional element or combination of elements in the claim may add a specific limitation or combination of limitations that are not well-understood, routine, conventional activity in the field, which is indicative that an inventive concept may be present. For example, a combination of steps to gather data in an unconventional way can include an inventive concept rendering the claim patent eligible.

Even assuming arguendo that claims 1 and 10 claim an abstract idea, claims 1 and 10 each recite something significantly more than the abstract idea under Step 2B of the Alice test. Claims 1 and 10 do not recite mere field-of-use restriction or technological environment or mere application of an abstract idea on a computer, but each recite detailed steps undertaken to overcome the problem in the prior art. Claims 1 and 10 each include: (1) acquiring a prediction model that is statistically constructed from past worker path data, including x-coordinates and y-coordinates of a center of gravity, a position of a head and a position of a joint of at least one past worker over at least one past path during at least one past work, past intermediate quality data of the at least one past work, and past final quality data of the at least one past work; (2) acquiring image data in which the target worker is captured performing the work, the image data including a plurality of frames; (3) a work start recognition step of recognizing from the acquired image data whether a work item has been started; (4) a work end recognition step of determining whether the work item has been ended based on the acquired image data; (5) an unusual work time period detection step of (5a) acquiring a work time period from a difference between a work start time point recognized in the work start recognition step and a work end time point recognized in the work end recognition step, (5b) comparing the acquired work time period with a work time threshold value that is preset, and, based on the comparison, (5c) determining whether the acquired work time period is a usual work time period or an unusual work time period; (6) wherein whether the work item has been started is determined from transition of feature quantities of individual images in a plurality of frames of past images; and (7) wherein whether the work item has been ended is determined from the transition of feature quantities of individual images in the plurality of frames of past images.

The claimed invention makes it possible to use computer analysis, calculation, and comparison to generate an unusualness degree, from transition of feature quantities of individual images in a plurality of frames of past images, and by comparing the unusualness degree with a preset threshold to determine whether unusualness has been reached or not. As such, the claim elements on their face improve a technology so as to constitute an inventive concept.

Significantly, the Office Action does not offer any evidence to support the conclusion that the inventive concept as summarized by the recited steps are well-understood, routine, or conventional. The Federal Circuit has repeatedly emphasized that the Alice test Step 2B may find an inventive concept in a new combination of steps even though all the constituents of the combination were well known and in common use before the combination was made. See, e.g., *Rapid Litigation Management, Ltd. v. Cellsdirect, Inc.*, 827 F.3d 1042 (Fed. Cir. 2016). The Office Action ignores this important legal principle and, again, fails to consider the claim as a whole. For example, the Office Action at page 5 simply states that the claims "do not recite anything that is beyond conventional and routine use of computers" and that the additional elements recited in the claims are "merely extensions of the abstract idea." These conclusory statements do not consider whether the combination of steps are well-understood, routine, or conventional, much less offering any evidence of a well-understood, routine, conventional claim. Therefore, the conclusion has no merit.

Claims 1 and 10 each recite a new combination of specific detailed steps. Under *Rapid Litigation Management*, this new combination of specific steps of evaluating information, calculating, manipulating data, and outputting results in an unconventional way, taken as a whole, produces an inventive concept that renders the claim patent eligible.

In view of the foregoing, Applicant respectfully submits that claims 1, 3, 8, and 10-14 comply with 35 U.S.C. §101.

Conclusion

In view of the foregoing, Applicants respectfully request that a timely Notice of Allowance be issued in this case. Please charge any shortage of fees due in connection with the filing of this paper, or credit any overpayment of fees, to Deposit Account 50-1417.

Respectfully submitted,

MATTINGLY & MALUR, PC

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Amendments to the Claims:

This listing of claims will replace all prior versions and listing of claims in the application.

Listing of Claims:

1. (Currently amended) A method for work quality control of a target worker in work where repetitive operation is performed, the method comprising:

a prediction model construction step of acquiring a prediction model that is statistically constructed from past worker path data, including x-coordinates and y-coordinates of a center of gravity, a position of a head and a position of a joint of at least one past worker over at least one past path during at least one past work, past intermediate quality data of the at least one past work, and past final quality data of the at least one past work;

an image data acquisition step of acquiring image data in which the target worker is captured performing the work, the image data including a plurality of frames;

a worker position recognition step of recognizing a plurality of positions of the target worker, including x-coordinates and y-coordinates of a center of gravity, a position of a head and a position of a joint of the target worker during target work, from the image data; ~~and~~

an unusual worker position determining step of substituting the positions of the target worker recognized in the worker position recognition step into the prediction model to estimate a path of the target worker based on the plurality of positions of the target worker, to calculate a difference between data on the estimated path and preset normal path data of the target worker, to compare the calculated difference with a path threshold value that is preset, and, based on the comparison, to determine whether the estimated path of the target worker is a usual path or an unusual path;

a work start recognition step of recognizing from the acquired image data whether a work item has been started;

a work end recognition step of determining whether the work item has been ended based on the acquired image data; and

an unusual work time period detection step of acquiring a work time period from a difference between a work start time point recognized in the work start recognition step and a work end time point recognized in the work end recognition step, comparing the acquired work time period with a work time threshold value that is preset, and, based on the comparison, determining whether the acquired work time period is a usual work time period or an unusual work time period;

wherein whether the work item has been started is determined from transition of feature quantities of individual images in a plurality of frames of past images; and wherein whether the work item has been ended is determined from the transition of feature quantities of individual images in the plurality of frames of past images.

2. (Canceled).

3. (Previously presented) The method for work quality control according to claim 1, wherein

the determination of unusualness is performed using an unusualness degree, and further comprising:

a step of displaying the unusualness degree.

4.- 7. (Canceled).

8. (Currently amended) The method for work quality control according to claim ~~7~~1, further comprising:

defining a difference between the acquired work time period and the threshold value as an unusualness degree;

wherein the acquired work time period is a usual work time period if the unusualness degree is less than a certain value and the acquired work time period is an unusual work time period if the unusualness degree is greater than the certain value.

9. (Canceled).

10. (New) A method for work quality control of a target worker in work where repetitive operation is performed, the method comprising:

a prediction model construction step of acquiring a prediction model that is statistically constructed from past worker path data, including x-coordinates and y-coordinates of a center of gravity, a position of a head and a position of a joint of at least one past worker over at least one past path during at least one past work, past intermediate quality data of the at least one past work, and past final quality data of the at least one past work;

an image data acquisition step of acquiring image data in which the target worker is captured performing the work, the image data including a plurality of frames;

a work start recognition step of recognizing from the acquired image data whether a work item has been started;

a work end recognition step of determining whether the work item has been ended based on the acquired image data; and an unusual work time period detection step of acquiring a work time period from a difference between a work start time point recognized in the work start recognition step and a work end time point recognized in the work end recognition step, comparing the acquired work time period with a work time threshold value that is preset, and, based on the comparison, determining whether the acquired work time period is a usual work time period or an unusual work time period;

wherein whether the work item has been started is determined from transition of feature quantities of individual images in a plurality of frames of past images; and

wherein whether the work item has been ended is determined from the transition of feature quantities of individual images in the plurality of frames of past images.

11. (New) The method for work quality control according to claim 10, further comprising:

defining a difference between the acquired work time period and the threshold value as an unusualness degree;

wherein the acquired work time period is a usual work time period if the unusualness degree is less than a certain value and the acquired work time period is an unusual work time period if the unusualness degree is greater than the certain value.

12. (New) The method for work quality control according to claim 11, further comprising:

calculating the unusualness degree; and

displaying the unusualness degree on an unusualness degree transition display screen having a horizontal axis that represents processing time point or process ID (identification) and a vertical axis that represents the calculated unusualness degree.

13. (New) The method for work quality control according to claim 12, further comprising:

displaying a work time transition having a horizontal axis that represents processing time point or process ID (identification) and a vertical axis that represents the acquired work time period taken in each work.

14. (New) The method for work quality control according to claim 10, further comprising:

displaying a work time transition having a horizontal axis that represents processing time point or process ID (identification) and a vertical axis that represents the acquired work time period taken in each work.