CLAIMS:

1. A processor implemented method ~~(200)~~ for real time Region of Interest (ROI) detection in thermal face images based on a heuristic approach, the method comprising:

receiving, via one or more hardware processors, a thermal face image comprising one or more faces of a plurality of subjects screened at an entry point for temperature detection, wherein the one or more faces captured in thermal face image have varying orientation and having varying occlusion levels ~~(202)~~;

converting, via the one or more hardware processors, the thermal image and a pre-fed thermal template to a higher dimensional space, wherein the higher dimensional space enables obtaining face specific thermal signature, used to distinguish between a face and undesired objects in the thermal face image ~~(204)~~;

extracting, via the one or more hardware processors, a plurality of features of the thermal face image and the pre-fed thermal template in the higher dimensional space ~~(206)~~;

comparing, via the one or more hardware processors, the plurality of features extracted for the thermal image with the plurality of features extracted for the pre-fed thermal template using a Deep learning model to identify one or more face boundaries corresponding to one or more faces in the thermal face image, wherein pixel locations of the thermal face image which are close to the pre-fed template image, in the higher dimensional space, are considered to be part of a face region to identify the one or more face boundaries corresponding to the one or more faces in the thermal face image ~~(208)~~;

generating, via the one or more hardware processors, a binary image by thresholding the thermal face image within the identified one or more face boundaries ~~(210)~~;

cleaning, via the one or more hardware processors, the binary image using morphological closing and distance transform operations ~~(212)~~;

identifying, via the one or more hardware processors, a minimum and a maximum row number and column number of a foreground captured in the cleaned binary image to derive m rows and n columns covered by the foreground ~~(214)~~;

applying, via the one or more hardware processors, a first heuristic approach to identify a Region of Interest (ROI) of the one or more faces boundaries in the binary image, wherein the ROI lies at r^{th} row and c^{th} column of the foreground, wherein $r = \frac{1}{6} \times (m)$ and $c = \frac{1}{2} \times (n)$, and wherein $0 \leq r \leq m$ and $0 \leq c \leq n$ as the ROI ~~(216)~~;

applying, via the one or more hardware processors, a second heuristics approach if an artifact occludes the ROI, wherein the artifact is identified based on the pre-fed thermal template, and wherein the second heuristic approach comprises identifying a set of points, at 90 degrees and equidistant from the center of the identified ROI, as a revised ROI ~~(218)~~; and

determining, via the one or more hardware processors, the temperature of one of i) the ROI by determining absolute temperature of ROI and ii) the revised ROI by averaging temperature of the set of points ~~(220)~~.

2. The method as claimed in claim 1, wherein the pre-fed template is selected based on a general appearance of the plurality of subjects that introduces possible occlusion during face detection, and wherein general appearance

comprises at least one of head gear, facial features, face masks and the artifacts associated with the plurality of subjects.

3. The method as claimed in claim 1, wherein the artifacts comprise stickers of varying sizes, on center of the forehead.

4. A system ~~(100)~~ for real time Region of Interest (ROI) detection in thermal face images based on a heuristic approach , the system ~~(100)~~ comprising:

a memory ~~(102)~~ storing instructions;

one or more Input/Output (I/O) interfaces ~~(106)~~; and

one or more hardware processors ~~(104)~~ coupled to the memory ~~(102)~~ via the one or more I/O interfaces ~~(106~~), wherein the one or more hardware processors ~~(104)~~ are configured by the instructions to:

receive a thermal face image comprising one or more faces of a plurality of subjects screened at an entry point for temperature detection, wherein the one or more faces captured in thermal face image have varying orientation and having varying occlusion levels;

convert the thermal image and a pre-fed thermal template to a higher dimensional space, wherein the higher dimensional space enables obtaining face specific thermal signature, used to distinguish between a face and undesired objects in the thermal face image;

extract a plurality of features of the thermal face image and the pre-fed thermal template in the higher dimensional space;

compare the plurality of features extracted for the thermal image with the plurality of features extracted for the pre-fed thermal template using a Deep learning model <u>to identify one or more face boundaries corresponding to one or</u>

more faces in the thermal face image, wherein pixel locations of the thermal face image which are close to the pre-fed template image, in the higher dimensional space, are considered to be part of a face region to identify the one or more face boundaries corresponding to the one or more faces in the thermal face image;

generate a binary image by thresholding the thermal face image within the identified one or more face boundaries;

clean the binary image using morphological closing and distance transform operations;

identify a minimum and a maximum row number and column number of a foreground captured in the cleaned binary image to derive m rows and n columns covered by the foreground;

apply a first heuristic approach to identify a Region of Interest (ROI) of the one or more faces boundaries in the binary image, wherein the ROI lies at r^{th} row and c^{th} column of the foreground, wherein $r = \frac{1}{6} \times (m)$ and $c = \frac{1}{2} \times (n)$, and wherein $0 \leq r \leq m \; and \; 0 \leq c \leq n$ as the ROI;

detect using a thermal signature in the thermal face image, whether an artifact is present at the identified ROI;

apply a second heuristics approach if an artifact occludes the ROI, wherein the artifact is identified based on the pre-fed thermal template, and wherein the second heuristic approach comprises identifying a set of points, at 90 degrees and equidistant from the center of the identified ROI, as a revised ROI; and

determine the temperature of one of i) the ROI by determining absolute temperature of ROI and ii) the revised ROI by averaging temperature of the set of points.

5. The system as claimed in claim 4, wherein the pre-fed template is selected based on a general appearance of the plurality of subjects that introduces possible occlusion during face detection, wherein general appearance comprises at least one of head gear, facial features, face masks and the artifacts associated with the plurality of subjects.

6. The system as claimed in claim 4, wherein the artifacts comprise stickers of varying sizes on center of the forehead.

7. One or more non-transitory machine-readable information storage mediums comprising one or more instructions, which when executed by one or more hardware processors causes a method for real time Region of Interest (ROI) detection in thermal face images based on a heuristic approach, the method comprising:

receiving, via one or more hardware processors, a thermal face image comprising one or more faces of a plurality of subjects screened at an entry point for temperature detection, wherein the one or more faces captured in thermal face image have varying orientation and having varying occlusion levels;

converting, via the one or more hardware processors, the thermal image and a pre-fed thermal template to a higher dimensional space, wherein the higher dimensional space enables obtaining face specific thermal signature, used to distinguish between a face and undesired objects in the thermal face image;

extracting, via the one or more hardware processors, a plurality of features of the thermal face image and the pre-fed thermal template in the higher dimensional space;

comparing, via the one or more hardware processors, the plurality of features extracted for the thermal image with the plurality of features extracted for the pre-fed thermal template using a Deep learning model to identify one or more face boundaries corresponding to one or more faces in the thermal face image, wherein pixel locations of the thermal face image which are close to the pre-fed template image, in the higher dimensional space, are considered to be part of a face region to identify the one or more face boundaries corresponding to the one or more faces in the thermal face image;

generating, via the one or more hardware processors, a binary image by thresholding the thermal face image within the identified one or more face boundaries;

cleaning, via the one or more hardware processors, the binary image using morphological closing and distance transform operations;

identifying, via the one or more hardware processors, a minimum and a maximum row number and column number of a foreground captured in the cleaned binary image to derive m rows and n columns covered by the foreground;

applying, via the one or more hardware processors, a first heuristic approach to identify a Region of Interest (ROI) of the one or more faces boundaries in the binary image, wherein the ROI lies at r^{th} row and c^{th} column of the foreground, wherein $r = \frac{1}{6} \times (m)$ and $c = \frac{1}{2} \times (n)$, and wherein $0 \leq r \leq m$ and $0 \leq c \leq n$ as the ROI;

applying, via the one or more hardware processors, a second heuristics approach if an artifact occludes the ROI, wherein the artifact is identified based on the pre-fed thermal template, and wherein the second heuristic approach comprises identifying a set of points, at 90 degrees and equidistant from the center of the identified ROI, as a revised ROI; and

determining, via the one or more hardware processors, the temperature of one of i) the ROI by determining absolute temperature of ROI and ii) the revised ROI by averaging temperature of the set of points.