

CLAIMS

1. A computer-implemented method comprising:

receiving, by a computing system, a first image from a first camera of a set of one or more cameras;

detecting, in the first image, a face of a first person;

comparing, by the computing system, the first image to a set of images stored in a local cache of the computing system,

wherein the set of images stored in the local cache are images of one or more persons that have been recognized in at least one image captured by the set of one or more cameras during a recent time period, and

wherein the computing system is configured to remove from the local cache images of persons not recognized in any image captured by the set of one or more cameras during the recent time period, such that the first image is compared only to images of the one or more persons that have been recognized in at least one image captured by the set of one or more cameras during the recent time period;

determining, based on the comparison, whether the face of the first person matches a face of a person depicted by at least one image of the set of images stored in the local cache; and

in response to determining that the face of the first person does not match a face of a person depicted by at least one image of the set of images stored in the local cache:

selecting, by the computing system and from a plurality of images of the first person captured by the set of one or more cameras, a highest quality image of the first person that includes a highest quality depiction of the face of the first person, the plurality of images including the first image;

providing the highest quality image of the first person to a server system that stores data for multiple people, wherein the server system compares the highest quality image of the first person to images from the data for the multiple people to identify the first person, including comparing the highest quality image of the first person to images of persons stored at the server system that were captured prior to the recent time period; and

receiving, by the computing system and from the server system based on a result of comparing the highest quality image of the first person to the images of persons stored at the

server system that were captured prior to the recent time period, data that identifies the first person.

2. The method of claim 1, further comprising:

associating an identifier for the first person with the highest quality image of the first person; and

storing the highest quality image of the first person in the local cache as part of the set of images.

3. The method of claim 2, further comprising:

receiving by the computing system, a second image of the first person;

detecting, by the computing system, a face in the second image;

comparing, by the computing system, the second image to the set of images;

determining, by the computing system, that the face in the second image matches the face of the first person depicted in the highest quality image; and

in response to determining that the face in the second image matches the face of the first person depicted in the highest quality image, associating the identifier for the first person with the second image without providing the second image to the server system.

4. The method of claim 1, wherein each image of the set of images depicts a person for which the computing system has received, from the server system, data that identifies the person depicted by the image in response to the image being provided to the server system.

5. The method of claim 1, further comprising:

determining that the face of the first person is no longer visible in images captured by the first camera;

receiving, from a second camera of the one or more cameras, a sequence of images captured by the second camera;

determining that a second image in the sequence of images depicts a face that was not visible in images captured by the second camera prior to the second image being captured or prior to the first person becoming no longer visible in images captured by the first camera;

determining, based at least on relative locations of the first camera and the second camera, that the face depicted by the second image may be the face of the first person;
comparing the second image to one or more images of the face of the first person;
determining, based on the comparison of the second image to one or more images of the face of the first person, that the face depicted by the second image matches the face of the first person; and
assigning an identifier for the first person to the second image.

6. The method of claim 5, wherein determining, based at least on relative locations of the first camera and the second camera, that the face depicted by the second image may be the face of the first person further comprises determining that the face depicted by the second image may be the face of the first person based on a time at which the face of the first person became no longer visible in images captured by the first camera and a time at which the second image was captured.

7. The method of claim 5, wherein determining, based at least on relative locations of the first camera and the second camera, that the face depicted by the second image may be the face of the first person further comprises determining that the face depicted by the second image may be the face of the first person based on a travel direction of the first person with respect to a location of the first camera and a location of the second camera.

8. The method of claim 1, wherein selecting the highest quality image of the first person comprises:

identifying multiple images of the first person; and
determining the highest quality image of the first person from among the multiple images.

9. The method of claim 1, wherein the highest quality image of the first person is an image that has at least a threshold quality depiction of the face of the first person.

10. A system, comprising:

a data processing apparatus; and

a memory storage apparatus in data communication with the data processing apparatus, the memory storage apparatus storing instructions executable by the data processing apparatus and that upon such execution cause the data processing apparatus to perform operations comprising:

receiving a first image from a first camera of a set of one or more cameras;

detecting, in the first image, a face of a first person;

comparing the first image to a set of images stored in a local cache of the data processing apparatus,

wherein the set of images stored in the local cache are images of one or more persons that have been recognized in at least one image captured by the set of one or more cameras during a recent time period, and

wherein the data processing apparatus is configured to remove from the local cache images of persons not recognized in any image captured by the set of one or more cameras during the recent time period, such that the first image is compared only to images of the one or more persons that have been recognized in at least one image captured by the set of one or more cameras during the recent time period;

determining, based on the comparison, whether the face of the first person matches a face of a person depicted by at least one image of the set of images; stored in the local cache and

in response to determining that the face of the first person does not match a face of a person depicted by at least one image of the set of images stored in the local cache:

selecting, from a plurality of images of the first person captured by the set of one or more cameras, a highest quality image of the first person that includes a highest quality depiction of the face of the first person, the images including the first image;

providing the highest quality image of the first person to a server system that stores data for multiple people, wherein the server system compares the highest quality image of the first person to images from the data for the multiple people to identify the first person, including comparing the highest quality image of the first person to images of persons stored at the server system that were captured prior to the recent time period; and

receiving, from the server system based on a result of comparing the highest quality image of the first person to the images of persons stored at the server system that were captured prior to the recent time period, data that identifies the first person.

11. The system of claim 10, wherein the operations comprise:

associating an identifier for the first person with the highest quality image of the first person; and

storing the highest quality image of the first person in the local cache as part of the set of images.

12. The system of claim 11, wherein the operations comprise:

receiving a second image of the first person;

detecting a face in the second image;

comparing the second image to the set of images;

determining that the face in the second image matches the face of the first person depicted in the highest quality image; and

in response to determining that the face in the second image matches the face of the first person depicted in the highest quality image, associating the identifier for the first person with the second image without providing the second image to the server system.

13. The system of claim 10, wherein each image of the set of images depicts a person for which the data processing apparatus has received, from the server system, data that identifies the person depicted by the image in response to the image being provided to the server system.

14. The system of claim 10, wherein the operations comprise:

determining that the face of the first person is no longer visible in images captured by the first camera;

receiving, from a second camera of the one or more cameras, a sequence of images captured by the second camera;

determining that a second image in the sequence of images depicts a face that was not visible in images captured by the second camera prior to the second image being captured or

prior to the first person becoming no longer visible in images captured by the first camera;
determining, based at least on relative locations of the first camera and the second camera, that the face depicted by the second image may be the face of the first person;
comparing the second image to one or more images of the face of the first person;
determining, based on the comparison of the second image to one or more images of the face of the first person, that the face depicted by the second image matches the face of the first person; and
assigning an identifier for the first person to the second image.

15. The system of claim 14, wherein determining, based at least on relative locations of the first camera and the second camera, that the face depicted by the second image may be the face of the first person further comprises determining that the face depicted by the second image may be the face of the first person based on a time at which the face of the first person became no longer visible in images captured by the first camera and a time at which the second image was captured.

16. The system of claim 14, wherein determining, based at least on relative locations of the first camera and the second camera, that the face depicted by the second image may be the face of the first person further comprises determining that the face depicted by the second image may be the face of the first person based on a travel direction of the first person with respect to a location of the first camera and a location of the second camera.

17. The system of claim 10, wherein selecting the highest quality image comprises:
identifying multiple images of the first person; and
determining the highest quality image of the first person from among the multiple images.

18. A computer program product, encoded on one or more non-transitory computer storage media, comprising instructions that when executed by one or more computers cause the one or more computers to perform operations comprising:
receiving, by the one or more computers, a first image from a first camera of a set of one

or more cameras;

detecting, in the first image, a face of a first person;

comparing, by the one or more computers, the first image to a set of images stored in a local cache of the one or more computers,

wherein the set of images stored in the local cache are images of one or more persons that have been recognized in at least one image captured by the set of one or more cameras during a recent time period, and

wherein the one or more computers are configured to remove from the local cache images of persons not recognized in any image captured by the set of one or more cameras during the recent time period, such that the first image is compared only to images of the one or more persons that have been recognized in at least one image captured by the set of one or more cameras during the recent time period;

determining, based on the comparison, whether the face of the first person matches a face of a person depicted by at least one image of the set of images stored in the local cache; and

in response to determining that the face of the first person does not match a face of a person depicted by at least one image of the set of images stored in the local cache:

selecting, by the one or more computers and from a plurality of images of the first person captured by the set of one or more cameras, a highest quality image of the first person that includes a highest quality depiction of the face of the first person, the plurality of images including the first image;

providing the highest quality image of the first person to a server system that stores data for multiple people, wherein the server system compares the highest quality image of the first person to images from the data for the multiple people to identify the first person, including comparing the highest quality image of the first person to images of persons stored at the server system that were captured prior to the recent time period; and

receiving, by the one or more computers and from the server system based on a result of comparing the highest quality image of the first person to images of persons stored at the server system that were captured prior to the recent time period, data that identifies the first person.

19. The computer program product of claim 18, wherein the operations comprise:
associating an identifier for the first person with the highest quality image of the first person; and
storing the highest quality image of the first person in the local cache as part of the set of images.
20. The computer program product of claim 19, wherein the operations comprise:
receiving by the one or more computers, a second image of the first person;
detecting, by the one or more computers, a face in the second image;
comparing, by the one or more computers, the second image to the set of images;
determining, by the one or more computers, that the face in the second image matches the face of the first person depicted in the highest quality image; and
in response to determining that the face in the second image matches the face of the first person depicted in the highest quality image, associating the identifier for the first person with the second image without providing the second image to the server system.