

CLAIMS

1. A computer-implemented method for a blockchain-based service, comprising:

collecting appearance data of a target entity as collected appearance data, the target entity comprising a physical entity capable of accessing, as a member, a blockchain;

5 registering, in a distributed database associated with the blockchain, the appearance data as an identity of the target entity;

receiving a target transaction initiated by a member node device in the blockchain, wherein the target transaction comprises the appearance data of the target entity that is collected by the member node device and a service event that is related to the target entity and that is
10 detected by the member node device;

invoking a smart contract that corresponds to the service event; and

executing, based on the identity indicated by the appearance data of the target entity, service logic stated in the smart contract.

15 2. The computer-implemented method of claim 1, wherein collecting the appearance data comprises:

collecting, by using a mounted optical sensor and as collected appearance data, the appearance data of the target entity that is solidified by an optical medium applied to an outer surface of the target entity.

20

3. The computer-implemented method of claim 2, wherein the optical medium comprises a nano-optical film.

4. The computer-implemented method of claim 1, wherein registering the appearance data
25 comprises:

storing the appearance data in the distributed database of the blockchain to form an association with the identity of the target entity that is registered in the blockchain.

5. The computer-implemented method of claim 1, further comprising:

30 determining whether changes occur with respect to the collected appearance data of the

target entity;

in response to determining that changes occur with respect to the collected appearance data of the target entity, updating, based on changed appearance data, the appearance data that is registered in the distributed database of the blockchain;

5 generating a corresponding updated record; and

storing the corresponding updated record in the distributed database associated with the blockchain.

6. The computer-implemented method of claim 1, wherein the target entity comprises a vehicle,
10 and the member node device comprises a public transport device that accesses the blockchain.

7. The computer-implemented method of claim 6, wherein:

15 the service event comprises a vehicle violation event, and the service logic stated in the smart contract comprises violation processing logic that corresponds to the vehicle violation event;

 the service event comprises a vehicle accident event, and the service logic stated in the smart contract comprises vehicle accident liability determining logic and vehicle accident settlement logic that correspond to the vehicle accident event;

20 the service event comprises a traffic congestion event, and the service logic stated in the smart contract comprises right-of-way yielding logic that corresponds to the traffic congestion event;

 the service event comprises a driving event of entering a planned road section by the vehicle, and the service logic stated in the smart contract comprises reward logic that corresponds to the driving event of entering a planned road section by the vehicle; or

25 the service event comprises a driving event of entering a planned road section by the vehicle, and the service logic stated in the smart contract comprises service logic that corresponds to the driving event of entering a planned road section by a vehicle.

8. A non-transitory, computer-readable medium storing one or more instructions executable by a
30 computer system to perform operations comprising:

collecting appearance data of a target entity as collected appearance data, the target entity

comprising a physical entity capable of accessing, as a member, a blockchain;

registering, in a distributed database associated with the blockchain, the appearance data as an identity of the target entity;

receiving a target transaction initiated by a member node device in the blockchain,
 5 wherein the target transaction comprises the appearance data of the target entity that is collected by the member node device and a service event that is related to the target entity and that is detected by the member node device;

invoking a smart contract that corresponds to the service event; and

executing, based on the identity indicated by the appearance data of the target entity,
 10 service logic stated in the smart contract.

9. The non-transitory, computer-readable medium of claim 8, wherein collecting the appearance data comprises:

collecting, by using a mounted optical sensor and as collected appearance data, the
 15 appearance data of the target entity that is solidified by an optical medium applied to an outer surface of the target entity.

10. The non-transitory, computer-readable medium of claim 9, wherein the optical medium comprises a nano-optical film.

20

11. The non-transitory, computer-readable medium of claim 8, wherein registering the appearance data comprises:

storing the appearance data in the distributed database of the blockchain to form an association with the identity of the target entity that is registered in the blockchain.

25

12. The non-transitory, computer-readable medium of claim 8, further comprising:

determining whether changes occur with respect to the collected appearance data of the target entity;

in response to determining that changes occur with respect to the collected appearance
 30 data of the target entity, updating, based on changed appearance data, the appearance data that is registered in the distributed database of the blockchain;

generating a corresponding updated record; and
 storing the corresponding updated record in the distributed database associated with the blockchain.

5 13. The non-transitory, computer-readable medium of claim 8, wherein the target entity comprises a vehicle, and the member node device comprises a public transport device that accesses the blockchain.

14. The non-transitory, computer-readable medium of claim 13, wherein:

10 the service event comprises a vehicle violation event, and the service logic stated in the smart contract comprises violation processing logic that corresponds to the vehicle violation event;

the service event comprises a vehicle accident event, and the service logic stated in the smart contract comprises vehicle accident liability determining logic and vehicle accident
 15 settlement logic that correspond to the vehicle accident event;

the service event comprises a traffic congestion event, and the service logic stated in the smart contract comprises right-of-way yielding logic that corresponds to the traffic congestion event;

the service event comprises a driving event of entering a planned road section by the
 20 vehicle, and the service logic stated in the smart contract comprises reward logic that corresponds to the driving event of entering a planned road section by the vehicle; or

the service event comprises a driving event of entering a planned road section by the vehicle, and the service logic stated in the smart contract comprises service logic that corresponds to the driving event of entering a planned road section by a vehicle.

25

15. A computer-implemented system, comprising:

one or more computers; and

one or more computer memory devices interoperably coupled with the one or more computers and having tangible, non-transitory, machine-readable media storing one or more instructions that, when executed by the one or more computers, perform one or more operations comprising:

collecting appearance data of a target entity as collected appearance data, the target entity comprising a physical entity capable of accessing, as a member, a blockchain;

5 registering, in a distributed database associated with the blockchain, the appearance data as an identity of the target entity;

receiving a target transaction initiated by a member node device in the blockchain, wherein the target transaction comprises the appearance data of the target entity that is collected by the member node device and a service event that is related to the target entity and that is detected by the member node device;

10 invoking a smart contract that corresponds to the service event; and

executing, based on the identity indicated by the appearance data of the target entity, service logic stated in the smart contract.

15 16. The computer-implemented system of claim 15, wherein collecting the appearance data comprises:

collecting, by using a mounted optical sensor and as collected appearance data, the appearance data of the target entity that is solidified by an optical medium applied to an outer surface of the target entity.

20 17. The computer-implemented system of claim 16, wherein the optical medium comprises a nano-optical film.

18. The computer-implemented system of claim 15, wherein registering the appearance data comprises:

25 storing the appearance data in the distributed database of the blockchain to form an association with the identity of the target entity that is registered in the blockchain.

19. The computer-implemented system of claim 15, further comprising:

30 determining whether changes occur with respect to the collected appearance data of the target entity;

in response to determining that changes occur with respect to the collected appearance

data of the target entity, updating, based on changed appearance data, the appearance data that is registered in the distributed database of the blockchain;

generating a corresponding updated record; and

storing the corresponding updated record in the distributed database associated with the

5 blockchain.

20. The computer-implemented system of claim 15, wherein:

the target entity comprises a vehicle, and the member node device comprises a public transport device that accesses the blockchain; and

10 wherein:

the service event comprises a vehicle violation event, and the service logic stated in the smart contract comprises violation processing logic that corresponds to the vehicle violation event;

15 the service event comprises a vehicle accident event, and the service logic stated in the smart contract comprises vehicle accident liability determining logic and vehicle accident settlement logic that correspond to the vehicle accident event;

the service event comprises a traffic congestion event, and the service logic stated in the smart contract comprises right-of-way yielding logic that corresponds to the traffic congestion event;

20 the service event comprises a driving event of entering a planned road section by the vehicle, and the service logic stated in the smart contract comprises reward logic that corresponds to the driving event of entering a planned road section by the vehicle; or

25 the service event comprises a driving event of entering a planned road section by the vehicle, and the service logic stated in the smart contract comprises service logic that corresponds to the driving event of entering a planned road section by a vehicle.