may rely on log-in credentials (e.g., username and password) to confirm a cardholder's identity. However, if the log-in credentials are compromised, another person could have access to the user's account.

[0006] These and other deficiencies exist. Accordingly, there is a need to provide users with an appropriate solution that overcomes these deficiencies to provide data security, authentication, and verification for contactless cards. Further, there is a need for both an improved method of activating a card and an improved authentication for account access.

SUMMARY

[0007] Aspects of the disclosed technology include systems and methods for cryptographic authentication of contactless cards. Various embodiments describe systems and methods for implementing and managing cryptographic authentication of contactless cards.

[0007a] In a first aspect, the present disclosure provides data transmission system, comprising: a receiving application comprising instructions for execution on a receiving device having a processor, a memory, a communication interface configured to create a communication field, and one or more sensors, wherein the receiving application is configured to: receive, via one or more sensors, feedback information associated with a transmitting device, and present one or more instructions regarding at least one selected from the group of a position of the transmitting device relative to the receiving device and an orientation of the transmitting device relative to the receiving device.

[0007b] In a second aspect, the present disclosure provides a method for establishing data transmission, the method comprising: generating, by the receiving application comprising instructions for execution on a receiving device, a communication field for data communication with a transmitting device; receiving, by a receiving application, feedback

information associated with the transmitting device; and presenting, by the receiving application, one or more guidance instructions on the receiving device regarding at least one selected from the group of a position of the transmitting device relative to the receiving device and an orientation of the transmitting device relative to the receiving device.

[0007c] In a third aspect, the present disclosure provides non-transitory computer accessible medium containing computer executable instructions that, when executed by a processor, perform procedures comprising: generating a communication field; utilizing one or more sensors to detect a transmitting device; utilizing the one or more sensors to track at least one selected from the group of a position of the transmitting device relative to the receiving device and an orientation of the transmitting device relative to the receiving device; generating one or more guidance instructions regarding at least one selected from the group of the position of the transmitting device relative to the receiving device and the orientation of the transmitting device relative to the receiving device; presenting the one or more guidance instructions until the transmitting device enters the communication field; and discontinuing the presentation of the one or more guidance instructions after the transmitting device enters the communication field.

[0008] Embodiments of the present disclosure provide a data transmission system comprising: a transmitting device having a processor, a memory, and a communication interface; a receiving application comprising instructions for execution on a receiving device having a processor, a memory, a communication interface configured to create a communication field for data communication with the transmitting device, and one or more sensors; wherein, upon movement of the transmitting device, the receiving application is configured to: receive, via one or more sensors, feedback information associated with the transmitting device, display one

[0009] or more instructions regarding the position of the transmitting device relative to the receiving device until the transmitting device enters the communication field; and wherein, upon entry into the communication field, the transmitting device is configured to transmit data to the receiving device.

[0010] Embodiments of the present disclosure provide method of guiding a transmitting device

CLAIMS

What is claimed is:

1. A data transmission system, comprising:

a receiving application comprising instructions for execution on a receiving device having a processor, a memory, a communication interface configured to create a communication field, and one or more sensors,

wherein the receiving application is configured to:

receive, via one or more sensors, feedback information associated with a transmitting device, and

present one or more instructions regarding at least one selected from the group of a position of the transmitting device relative to the receiving device and an orientation of the transmitting device relative to the receiving device.

2. The data transmission system of claim 1, wherein the receiving application is configured to present the one or more instructions until the transmitting device enters the communication field.

3. The data transmission system of claim 1, wherein the receiving application is configured to continuously detect the position of the transmitting device relative to the receiving device and the orientation of the transmitting device relative to the receiving device.

4. The data transmission system of claim 1, wherein the one or more instructions comprises at least one selected from the group of textual guidance, audible guidance, and haptic guidance.

5. The data transmission system of claim 1, wherein the receiving application is configured to display one or more types of signal strength between the transmitting device and the receiving device for placement of the transmitting device with respect to one or more surfaces of the receiving device.

6. The data transmission system of claim 1, wherein the receiving application is configured to display a targeting box for positioning of the transmitting device.

7. The data transmission system of claim 6, wherein:

the receiving device includes a screen, and

the targeting box comprises a display region of the screen indicating a placement of the transmitting device.

8. The data transmission system of claim 6, wherein the one or more instructions are continuously updated based on the position of the transmitting device relative to the targeting box.

9. The data transmission system of claim 1, wherein:

the transmitting device comprises a contactless card, and

the receiving device comprises at least one selected from the group of a smartphone, a tablet, and a wearable mobile device.

10. A method for establishing data transmission, the method comprising:

generating, by the receiving application comprising instructions for execution on a receiving device, a communication field for data communication with a transmitting device;

receiving, by a receiving application, feedback information associated with the transmitting device; and

presenting, by the receiving application, one or more guidance instructions on the receiving device regarding at least one selected from the group of a position of the transmitting device relative to the receiving device and an orientation of the transmitting device relative to the receiving device.

11. The method of claim 10, wherein the feedback information comprises data related to movement of the transmitting device.

12. The method of claim 10, wherein the receiving application generates the one or more guidance instructions until the transmitting device enters the communication field.

13. The method of claim 13, wherein:

the receiving application ceases presenting the one or more guidance instructions after the transmitting device enters the communication field, and

the receiving application continues receiving feedback information after the transmitting device enters the communication field.

14. The method of claim 13, wherein the receiving application resumes presenting the one or more guidance instructions after the transmitting device exits the communication field.

15. The method of claim 10, wherein presenting the one or more guidance instructions comprises the display of an animation tracking the position of the transmitting device relative to the receiving device.

16. The method of claim 10, wherein the receiving application dynamically generates the one or more guidance instructions in response to the feedback information.

17. The method of claim 10, wherein the receiving application is configured to display one or more types of signal strength between the transmitting device and the receiving device for placement of the transmitting device with respect to one or more surfaces of the receiving device.

18. The method of claim 10, further comprising:

displaying, by the receiving application, a targeting box for positioning the transmitting device,

wherein the targeting box visually indicates a boundary for placement of at least one edge of the transmitting device.

19. The method of claim 18, wherein the boundary comprises a visual indication of two parallel edges of the transmitting device.

20. A non-transitory computer accessible medium containing computer executable instructions that, when executed by a processor, perform procedures comprising:

generating a communication field;

utilizing one or more sensors to detect a transmitting device;

utilizing the one or more sensors to track at least one selected from the group of a position of the transmitting device relative to the receiving device and an orientation of the transmitting device relative to the receiving device;

generating one or more guidance instructions regarding at least one selected from the group of the position of the transmitting device relative to the receiving device and the orientation of the transmitting device relative to the receiving device;

presenting the one or more guidance instructions until the transmitting device enters the communication field; and

discontinuing the presentation of the one or more guidance instructions after the transmitting device enters the communication field.