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Development of a Patient Face Recognition System in the Radiology Department

(Patient recognition accuracy of a face mask-enabled face recognition system in a CT examination environment)

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Porpose

Patient misidentification causes serious accidents in medical practice. Although facial image-based recognition systems have been used in many fields, they have not been used for patient recognition during examinations.

The purpose of this study is to evaluate a newly developed face mask-enabled face recognition system in a CT examination environment.

Method

The facial recognition system used was PFAS with mask (CANON MEDTECH SUPPLY, Kawasaki, Japan).

- 142 patients

(mean age 59+/-11 years, male/female ratio 59:41)

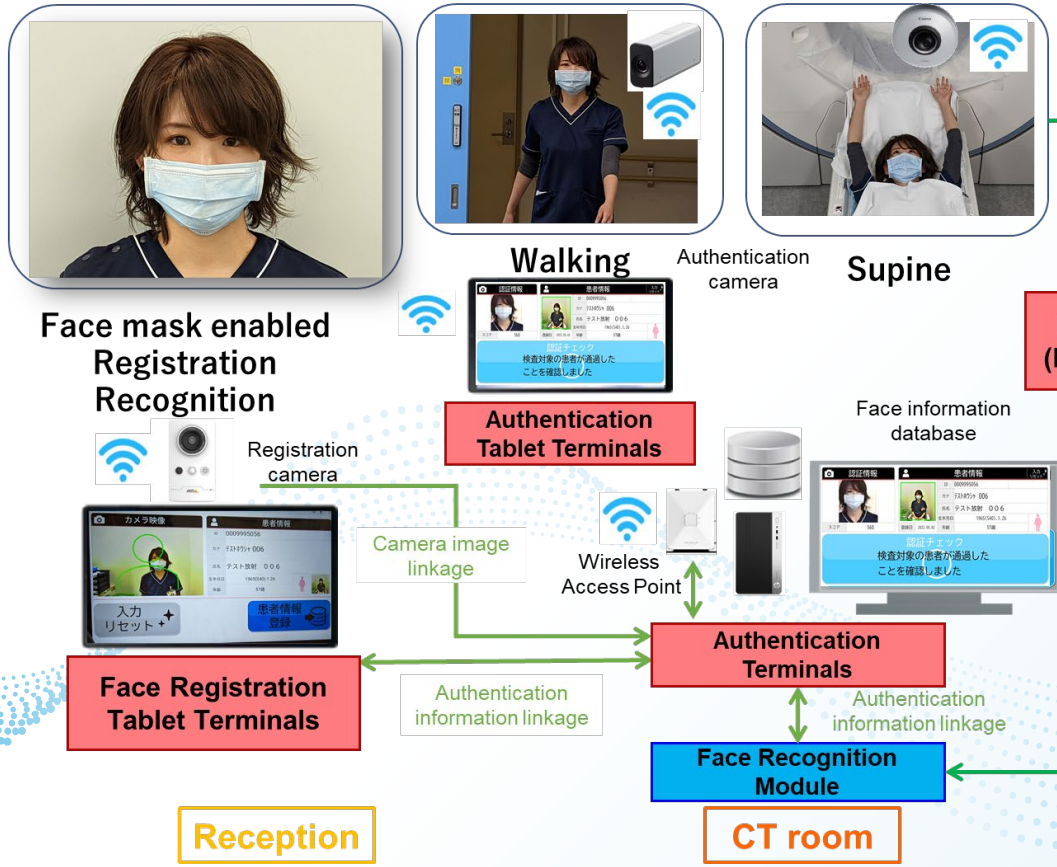
Cameras were installed to capture the patients.
Recognition was possible in both of these situations.

- When they entered the CT room (walking).
- When they were positioned (supine).

Method

- The recognition task was performed with the face mask worn, and the success rate was calculated from the recognition score.
- A significant difference test was conducted using Welch's t test for the authentication scores obtained in the two situations.
- In this system, an authentication score of 550 or higher (max:1000) is considered as a successful authentication.

Method - Information linkage -



Method -Recognition flow-

Result

✓Of 142 patients, 136 were successfully authenticated, for a success rate of 96%.

✓The reasons for the unsuccessful cases.

- The patients were wearing hats too deeply.
- 3 cases of overlapping with staff members.
- 2 cases of unknown cause.

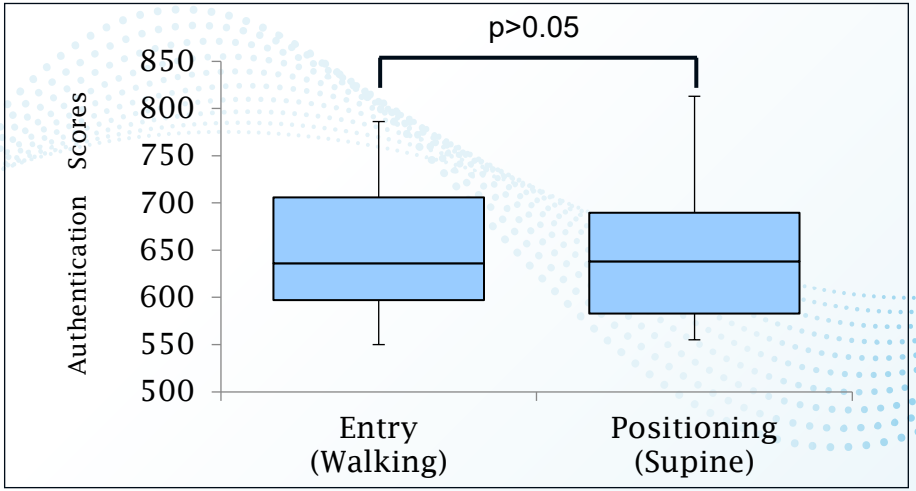
✓Of the 136 patients, 113 (83%) were authenticated when entering the room (walking) and 23 (17%) when positioning (supine).

Result

The mean authentication scores (mean +/- standard deviation) .

- Entry (walking)　648+/-66
- Positioning(supine)　643+/- 64

No significant difference (p>0.05) between the two.



Discussion

✓High authentication accuracy.
Two-way authentication provides more opportunities to recognize faces.

✓Efficient authentication flow.
Smooth face registration and stress-free face authentication.

✓Possibility of face recognition in hospitals.
Face recognition is possible in multiple situations.

➢ The system can be used in the clinical practice to prevent patient misidentification.

Conclusion

✓We confirmed that the accuracy of face recognition can be ensured even when the patient is wearing a face mask.

✓We have realized the practical application of patient authentication using the face recognition system.