

SaTC: CORE: Small: RUI: Improving Performance of Standoff Iris Recognition Systems Using Deep Learning Frameworks



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https://www.nsf.gov/awardsearch/showAward?AWD_ID=1909276&HistoricalAwards=false

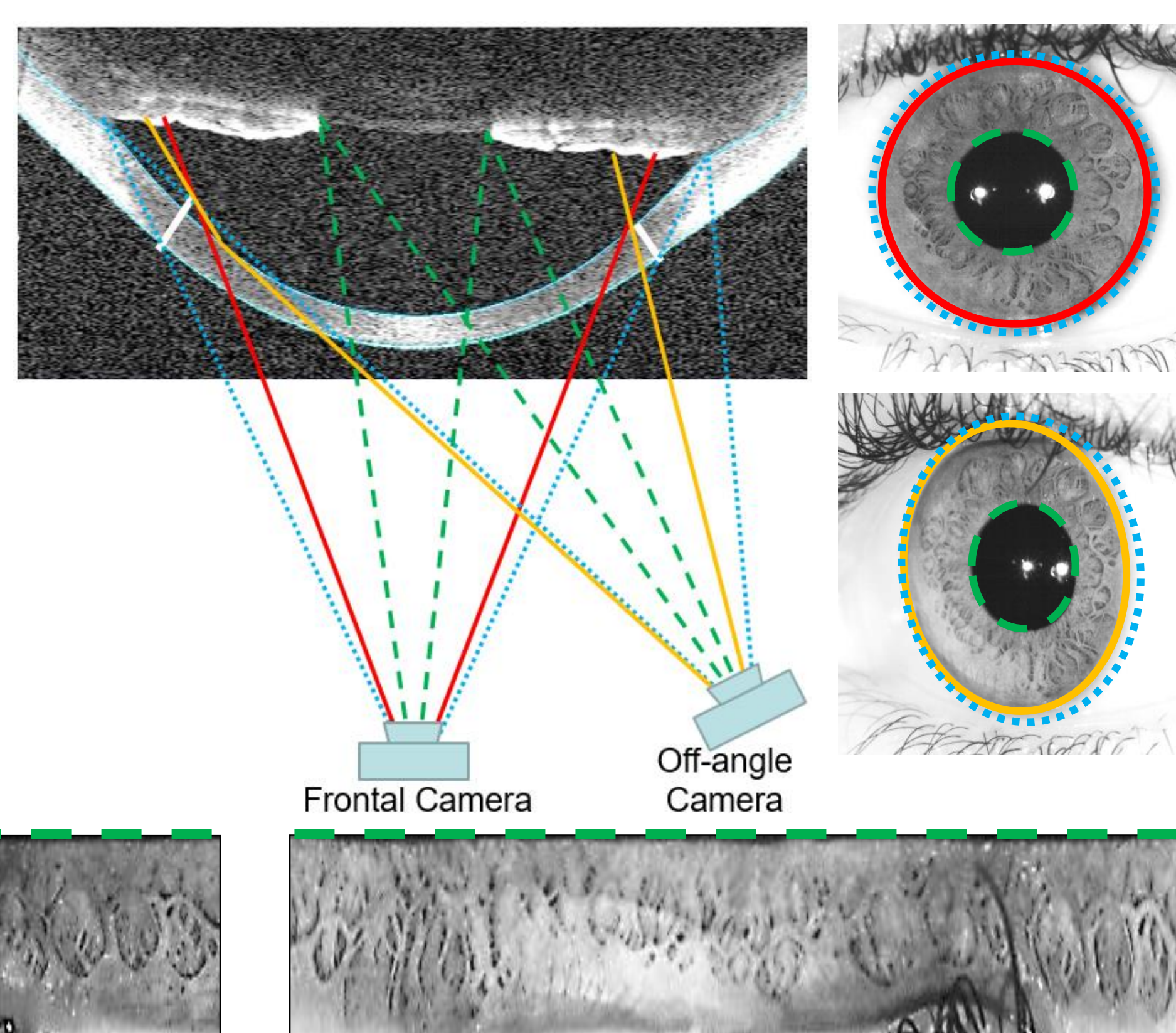
Objective 1: Developing of a deep learning-based image reconstruction module to transform the standoff images to the frontal versions to eliminate the challenging effects using a traditional recognition framework.

Objective 2: Developing of nontraditional iris recognition frameworks based on deep learning algorithms to improve performance of standoff systems using additional ocular and periocular biometrics.

Objective 3: Collecting real standoff iris images using a special two camera-based data collection platform.

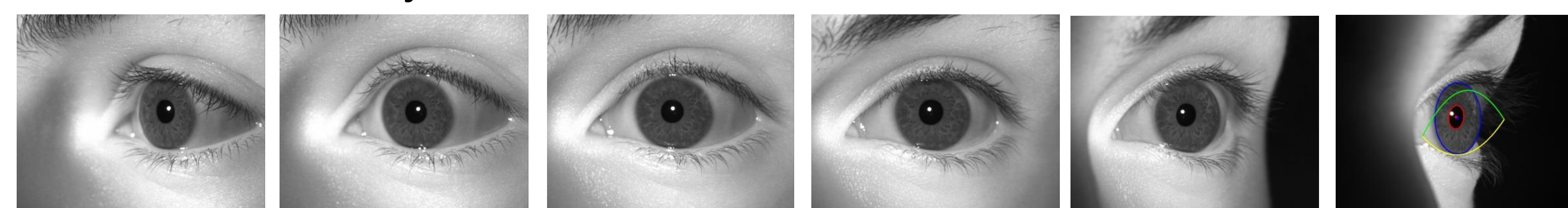
Challenges in standoff iris recognition

- Gaze Angle
 - Corneal Refraction
 - Limbus Occlusion
 - Depth of Field Blur
 - 3D Iris Texture
- Pupil Dilation
- Lens Accommodation



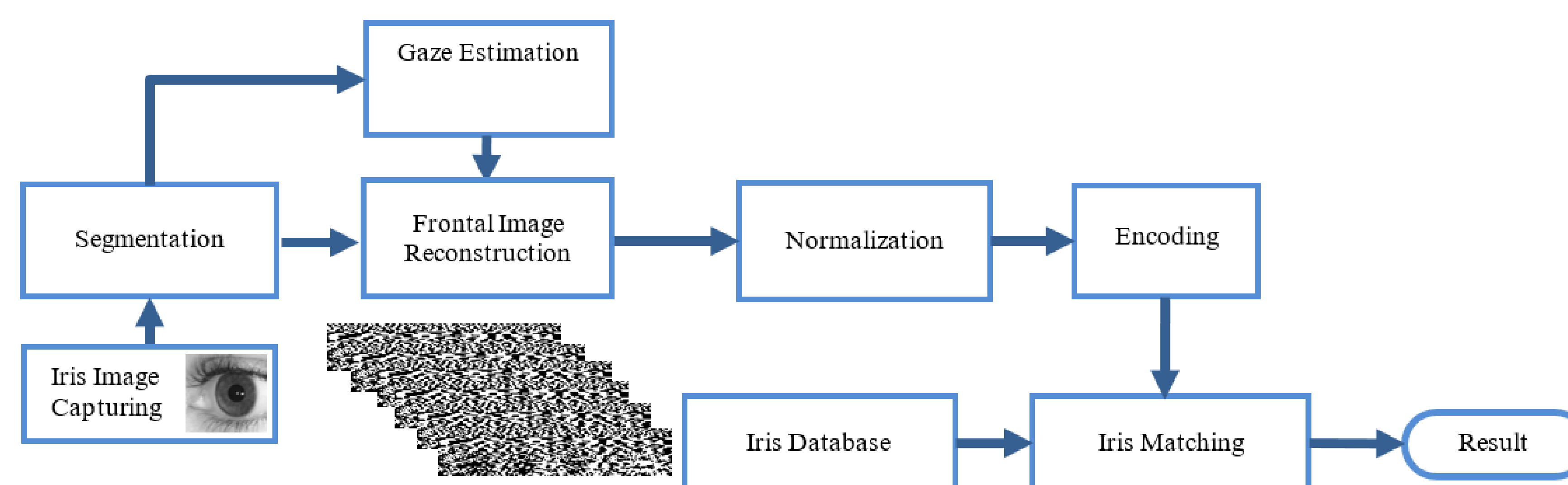
Standoff Iris Recognition Dataset:

- Two NIR sensitive IDS-UI-3240ML camera
- Navitar Zoom 7000 Lens
- 780 nm Power LED light source
- 720 nm high-pass infrared filter
- Angle : -50° to +50°
- Dilation: Different dilation levels
- Number of Subjects > 100



Traditional Iris Recognition: Frontal image reconstruction module to generate image distortion and occlusion maps to eliminate the effect of the eye structures.

Nontraditional Iris Recognition: Deep learning algorithms to improve performance of standoff systems using additional biometric information in ocular and periocular structures.



Website: Publishing the projects document to be released on the internet for the attention of the general public.

Workshop Days: Every spring semester for high school students to attract their attention for research opportunities in engineering.

Summer-School Weeks: Every summer for senior university students who design their final senior project.

- Improve the research environment at the University of Central Arkansas
- Improve the curriculum of the new Computer Engineering program
- Research and teaching integration at Digital Image Processing class
- Involve two undergraduate student in summer research experiences
- Provide research opportunities for students from underrepresented groups

International level: publishing in top-ranked journals and conferences

National level: enhance the national security and competitiveness of the United States

State level: rove the quality of research and education in Arkansas, an EPSCoR state.

University level: improve the research environment at UCA and the curriculum of the new Computer Engineering program.

