

Fundamentals of Biometric Identification

EEE-6561 Sections 1FE2, CAMP, 2FED

Class Periods: Mon., Weds, and Fri., Period 6, 12:50 PM-1:40 PM

Location: CSE E118

Academic Term: Spring 2020

Instructor:

- Name: Dr. Damon L. Woodard
- Email Address: dwoodard@ece.ufl.edu
- Office Phone Number: 352-273-2130
- Office Hours: Mon., Wed., Fri. 8:00 AM – 9:00 AM or by appointment, 226E Materials Engineering Bldg.

Teaching Assistants:

Please contact through the Canvas website

- Name: Sumaiya Shomaji (Jyoti)
- Email Address: shomaji@ufl.edu
- Office Hours: Tues. 5:00 PM – 6:00 PM, Weds. 5:00 PM – 6:00 PM, Fri. 11:30 AM – 12:30 PM, 119 Materials Engineering Bldg.

- Name: Ronald Wilson
- Email Address: ronaldwilson@ufl.edu
- Office Hours: Mon. 3:00 PM – 5:00 PM, Weds. 4:00 PM – 5:00 PM, 119 Materials Engineering Bldg.

Course Description

Methods and principles for the automatic identification/authentication of individuals. Technologies include fingerprint, face, and iris biometrics. Additional topics include biometric system design, performance evaluation, multi-modal biometric systems, and biometric system security.

Credits: 3

Course Pre-Requisites / Co-Requisites

EEE-6512 Image Processing and Computer Vision is a prerequisite for the course or instructor approval.

Course Objectives

This course introduces students to the fundamental principles and methods used for biometric identification. The goals of this course are to understand the process of biometric recognition as well as the challenges it poses as means of establishing identity. The objective of the course is to provide students with the scientific foundations needed to design, implement, and evaluate large-scale biometric identification systems. This objective will be met by the completion of multiple homework assignments which require the application of methods of biometric identification and system evaluation discussed during lecture. Also, the students' understanding of the main concepts will be assessed using multiple exams including a final.

Materials and Supply Fees

None

Required Textbooks and Software

- Title: Introduction to Biometrics
- Author: Anil K. Jain, Arun Ross, and Karthik Nandakumar
- Publication date, edition, and publisher: 2011, First Edition, Springer
- ISBN number: 978-0-387-77326-1

Software: Mathematical solver software such as MATLAB(available at UF ECE terminal server available by remote login)

Recommended Materials

None

Course Schedule

Week 1: Course Overview, Last Decade of Biometrics, Applications
Week 2: Overview of Biometric System Operation / **Homework #1 Due**
Week 3: Biometric System Evaluation
Week 4: Face Detection /**Homework #2 Due**
Week 5: Face Recognition /
Week 6: Fingerprint Recognition Pt. I / **Exam #1**
Week 7: Fingerprint Recognition Pt. II /**Homework #3 Due**
Week 8: Iris Recognition
Week 9: Spring Break (No Classes)
Week 10: Behavioral Biometrics / **Homework #4 Due**
Week 11: Multi-modal Biometrics & Biometric Fusion Pt. 1/ **Homework #5 Due**
Week 12: Multi-modal Biometrics & Biometric Fusion Pt. 2
Week 13: Biometric System Security and Spoofing/ **Exam #2**
Week 14: Biometric Template Protection / **Homework #6 Due**
Week 15: Privacy and Ethics

Attendance Policy, Class Expectations, and Make-Up Policy

Although attendance will not be recorded, it is expected that students attend all lectures. Excused absences are consistent with university policies in the undergraduate catalog (<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>) and require appropriate documentation.

Students are expected to take measures to minimize distractions for everyone (i.e. no newspapers, cell phone, PDA, laptops, etc. unless instructed to use them for class.

Makeup exams are contingent on appropriate justifications and legal documents (UF Dean of Students, certified physician, military active duty, judge for jury duty, etc.) Late assignments and projects will not be accepted

Evaluation of Grades

Assignment	Percentage of Final Grade
Homework Sets (6)	50%
Exams (2)	25%
Final Exam	25%
TOTAL	100%

Grading Policy

Percent	Grade	Grade Points
94 - 100	A	4.00
90 - 93	A-	3.67
88 - 89	B+	3.33
82 - 87	B	3.00
80 - 81	B-	2.67
78 - 79	C+	2.33
72 - 77	C	2.00

70 – 71	C-	1.67
62 – 69	D	1.00
0 – 61	E	0.00

More information on UF grading policy may be found at:

<http://gradcatalog.ufl.edu/content.php?catoid=10&navoid=2020#grades>

Students Requiring Accommodations

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, <https://www.dso.ufl.edu/drc>) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

Course Evaluation

Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at <https://evaluations.ufl.edu/evals>. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at <https://evaluations.ufl.edu/results/>.

University Honesty Policy

UF students are bound by The Honor Pledge which states, “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: “On my honor, I have neither given nor received unauthorized aid in doing this assignment.” The Honor Code (<https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Commitment to a Safe and Inclusive Learning Environment

The Herbert Wertheim College of Engineering values broad diversity within our community and is committed to individual and group empowerment, inclusion, and the elimination of discrimination. It is expected that every person in this class will treat one another with dignity and respect regardless of gender, sexuality, disability, age, socioeconomic status, ethnicity, race, and culture.

If you feel like your performance in class is being impacted by discrimination or harassment of any kind, please contact your instructor or any of the following:

- Your academic advisor or Graduate Program Coordinator
- Robin Bielling, Director of Human Resources, 352-392-0903, rbielling@eng.ufl.edu
- Curtis Taylor, Associate Dean of Student Affairs, 352-392-2177, taylor@eng.ufl.edu
- Toshikazu Nishida, Associate Dean of Academic Affairs, 352-392-0943, nishida@eng.ufl.edu

Software Use

All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

Student Privacy

There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see: <https://registrar.ufl.edu/ferpa.html>

Campus Resources:

Health and Wellness

U Matter, We Care:

Your well-being is important to the University of Florida. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact umatter@ufl.edu so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1.

Counseling and Wellness Center: <http://www.counseling.ufl.edu/cwc>, and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

Sexual Discrimination, Harassment, Assault, or Violence

If you or a friend has been subjected to sexual discrimination, sexual harassment, sexual assault, or violence contact the **Office of Title IX Compliance**, located at Yon Hall Room 427, 1908 Stadium Road, (352) 273-1094, title-ix@ufl.edu

Sexual Assault Recovery Services (SARS)

Student Health Care Center, 392-1161.

University Police Department at 392-1111 (or 9-1-1 for emergencies), or <http://www.police.ufl.edu/>.

Academic Resources

E-learning technical support, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu.
<https://lss.at.ufl.edu/help.shtml>.

Career Resource Center, Reitz Union, 392-1601. Career assistance and counseling. <https://www.crc.ufl.edu/>.

Library Support, <http://cms.uflib.ufl.edu/ask>. Various ways to receive assistance with respect to using the libraries or finding resources.

Teaching Center, Broward Hall, 392-2010 or 392-6420. General study skills and tutoring.
<https://teachingcenter.ufl.edu/>.

Writing Studio, 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and writing papers.
<https://writing.ufl.edu/writing-studio/>.

Student Complaints Campus: https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf.

On-Line Students Complaints: <http://www.distance.ufl.edu/student-complaint-process>.