About the course
Digital image processing has various applications ranging from remote sensing and entertainment to medical applications. This course explores a few major areas of digital image processing at an advanced level, with primary emphasis on medical applications. Topics covered included image segmentation, image registration, validation of image processing algorithms, and image processing using the Insight Toolkit (ITK) and Jupyter Notebook. Examples will be presented to give the students exposure to real world applications.

Lectures
- Monday 2:30-3:20pm, SH-3307
- Tuesday 5:30 -7:30pm, SEB-3109
- Start Date: Monday, January 7, 2019.

Final Exam
TBA

Course Instructor
Elvis Chen, PhD, LEL
chene@robarts.ca

Teaching Assistants & TA Office Hours
Reid Vassallo rvassall@uwo.ca
appointment by email only (1hr/week)

About the Instructor:
I obtained my PhD degree from Queen's University (Canada) and am currently a research associate at Robarts Research Institute with cross-appointments with 3 departments at Western University (Canada): Biomedical Engineering Graduate Program, Department of Medical Biophysics, and the Department of Electrical and computer Engineering. I primarily work in the field of Computer-Assisted Surgery, applying techniques from the field of computer vision, computer graphics, image processing, and robotics, to assist surgeons in their surgical deliveries. I am currently serving as an Associated Editor for IEEE Transactions on Medical Imaging (IEEE-TMI) and Journal of Medical Imaging (JMI), as well as a committee members for 4 international conferences (MICCAI/IPCAI/SPIE MI/CARS).

Site Usage
The method of course material delivery will be based on Jupyter Notebook which is a web-based and interactive front-end to the programming language python. The open-source image processing library, Insight Segmentation and Registration Toolkit (ITK), will be heavily utilized. Akin to the popular Matlab environment, this is a totally interactive with nothing to compile.

When needed, "skeleton" PowerPoint slides and Jupyter Notebook will be used to present course materials. These skeleton slides/Notebooks are not complete, and I will fill them in during the class to demonstrate the course materials in a logical and paced manner. These course materials will be posted on OWL website ahead of the class so you can print them and fill them in during the class: these skeleton slides will be posted on the left panel under "Lectures". As I continuously fill in these skeleton slides during each class, they will be re-posed under "Lectures" at the end of each class.

Please note the other course materials posted on OWL:

- course outline,
- assignment time tables - lists distribution and due dates for assignments,
- assignments - will hold assignments and solutions.

Expectations

Here is what I expect of every students:

- Honesty: some assignments and projects (for graduate students) will be performed in groups, but each group should do its own work,
- Attend all classes: I'd like to know you and you should know me. As there is no textbook for this course, it is a good idea for you to attend the class,
- Participation: this course is designed to be interactive. It is a good idea for your to ask questions in class and share ideas,
- Be timely: submit all assignments on time. This is always a good practice and failure to do so will result in heavy penalty,
- Keep up: course materials are built upon progressively. Review lectures and do your homework in a timely manner. Read emails from me as it is the best way for me to communicate with you outside of class,
- No MISSING midterm/assignments/final examination: unless you have proper and documented reasons, missing assignments/midterms/final examination will result in a score of zero, with NO EXCEPTION.

What you can expect of me:

- Effort: this course is designed from the group up: as technologies are changing so shall the way we teach. I put a lot of efforts in developing the course materials. My aim is to motivate you, get you ready for your future career and more importantly, teach you a skill that will help you in the long run,
- Punctually: I am never late for class and will always arrive early unless something goes wrong that is beyond my control,
• Availability: I respect posted office hours. I also try to be flexible to accommodate your schedule. I cannot always be available since I have other duties and deadlines, but I'll try my best,
• Fairness: I never take off marks unless justified.

ATTENDANCE POLICY

All classes, tutorials and tests/exams are mandatory, unless otherwise stated. Any student who, in the opinion of the course coordinator is absent too frequently from class or laboratory periods in any course, will receive a failing grade after due warning has been given in writing from the course coordinator and Graduate Chair.

CHEATING AND PLAGIARISM POLICY

Students are encouraged to work together, but each student must take total responsibility for his/her submitted work. Students must write their laboratory reports and final projects in their own words. Whenever students take an idea, or a passage from another author, they must acknowledge their debt both by using quotation marks where appropriate and by proper referencing such as footnotes or citations. University policy states that cheating, including plagiarism, is a scholastic offence. The commission of a scholastic offence is attended by academic penalties which might include expulsion from the program. If a student is caught cheating, there will be no second warning.

All written reports and projects may be subject to submission for textual similarity review to commercial plagiarism detection software under license to the University for the detection of plagiarism. All reports will be included as source documents on the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between the University of Western Ontario and Turnitin.com (http://www.turnitin.com).

See the School of Graduate and Postdoctoral Studies Scholastic Offence Policy: http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_grad.pdf

USE OF ELECTRONIC DEVICES POLICY

No electronic devices (e.g., cell phones, MP3 players) may be used during lectures or examinations. The use of non-programmable calculators is permitted during examinations; programmable calculators are prohibited during examinations.

OWL INTERNET/BULLETIN BOARD POLICY

It is the student’s responsibility to read the course website posted on Western’s on-line learning management system, OWL (https://owl.uwo.ca/portal). This includes the
course bulletin board and all information and/or assignments posted about the course. If the student fails to act on information that has been posted on the course site and does so without a legitimate explanation (i.e., those covered under the illness/compassionate form), then there are NO grounds for an appeal.

REQUEST FOR ASSIGNMENT EXTENSIONS

Students are advised to inform the course coordinator as soon as possible regarding an extension for assignment submissions due to medical reasons or other compassionate reasons. Extensions will only be granted by the course coordinators at their discretion.

ABSENCE DUE TO MEDICAL ILLNESS

Students must familiarize themselves with the Policy on Accommodation for Medical Illness:
https://studentservices.uwo.ca/secure/index.cfm

If you are unable to meet a course requirement due to illness or other serious or compassionate circumstances, you must provide valid medical or other supporting documentation to the course coordinator immediately. It is the student's responsibility to make alternative arrangements with the coordinator to complete missing course requirements.

A student requiring academic accommodation due to illness, should use the Student Medical Certificate:
http://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf
when visiting an off-campus medical facility or request a Record's Release Form for visits to Student Health Services. The form is available at:
http://www.health.uwo.ca/services/students/policies.html.

The release form will allow the course coordinator to confirm with Student Health Services that a student’s absence from regular attendance or inability to meet scheduled course commitments is due to medical reasons. The nature of the illness will not be divulged by Student Health Services.

GRADUATE STUDENTS’ MENTAL HEALTH AND PHYSICAL WELLNESS

As part of a successful graduate student experience at Western, students are encouraged to make their health and wellness a priority. Western provides several on campus health-related services to help you achieve optimum health and engage in healthy living while pursuing your graduate degree. For example, to support physical activity, all students, as part of their registration, receive membership in Western’s Campus Recreation Centre:
http://www.uwo.ca/campus_life/athletics.html
All facets of extracurricular campus life in which graduate students can participate are available on this URL:
http://www.uwo.ca/campus_life/arts_culture.html

Information regarding health and wellness-related services available to students may be found at http://www.health.uwo.ca. Students seeking help regarding mental health concerns are advised to speak to someone in whom they feel comfortable confiding, such as their graduate supervisor, their program director (Graduate Chair), or other relevant administrators in their unit. Campus mental health resources may be found at: http://www.health.uwo.ca/mental_health/resources.html

ACCESSIBILITY TO THE COURSE AND COURSE MATERIALS

Please contact the course co-ordinator if you require material in an alternate format or if you require any other arrangements to make this course more accessible to you. You may also wish to contact Services for Students with Disabilities (SSD) at 661-2111 x 82147 for any specific question regarding an accommodation.