**Title (** [Group #] **)**

[Make sure that the title well reflects the content of the project. Do not put something like “Image Analysis” **NOTE if you do not delete ALL the information in blue such as this then there will be a grade deduction of 10%.**]

**Authors**

[list all authors, for class projects giving the netID may also be useful]

**Abstract**

[A one-paragraph abstract outlining what the project is and what was achieved. It is important that this summarizes the objective, the method, the results and the conclusion of the report. A frequent error is just to discuss the topic of the project]

**1. Introduction**

[The introduction should outline the problem studied, the main issues in solving the problem, a review of related work and an outline of the remainder of the report. The problem description and proposed solution should include the clinical significance and the technical issues]

**1.1 Background**

[For an image analysis project the first section of the introduction should first outline what is the imaging approach and what the analysis is designed to achieve. The first section should also outline the problem area being addressed. What is that target disease? What is the clinical significance: how many are affected by the disease, what is the outcome without intervention, what is that which you are proposing to accomplish have an impact on the treatment or diagnosis of that disease.]

**1.2 Previous Work**

[A review of previous work done should be included that outlines the contributions of the papers that you have listed in the reference section at the end of your report and refers directly to them. In general, in addition to the reference number you should also include a first author and year in your citations as in “Jones et al 2012 [5] showed that .. ]

**1.2 Proof of concept example**

[Many projects will benefit from a proof on concept example that may be a based on either a synthetic or a real image that demonstrates directly the benefit of the method being explored. It is good for this example to demonstrate that conventional algorithm approaches to this task will not work as well as the proposed method. A challenge here is to select a *comparable* conventional approach for comparison]

**1.2 Overview**

[This section briefly outlines the following sections in the report and their contents]

**2. Methods**

[This section should include a description of the algorithms you used (with the rational for their design), the experiments that you conducted (with clearly stated objectives and predicted outcomes), and the data sets you used (possibly including relevant descriptive statistics and/or examples]

**2.1 Algorithm**

[Provide a step-by-step description of your key algorithm. Figures are often useful in algorithm descriptions especially diagrams rather than images. Mention relevant figures BEFORE you describe the algorithm not after so that you can refer to them in your algorithm description. Equations are useful in giving algorithm details; in some cases both a formal pseudo code description together with a word description are useful]

**2.2 Experiment**

[For any experiment at least four items must be described: (a) the hypothesis or objective of the experiment (b) the dataset and it's documentation, (c) the experiment procedure including the system parameters and which parameters will be varied (d) the quantitative objective function. The general approach to an experiment is to train and test a system on a specified documented data set for a set (matrix) of different system parameters to maximize a single quantitative performance function on the test set. The following subsections are suggested.

2.2.1 Hypothesis and evaluation function

What is the goal of the experiment and what single evaluation function will you use. State the rational.

2.2.2 Documented Data Set

Give details possibly with image examples of the image dataset. Indicate how the outcome “truth” documentation is established.

2.2.3 Experiment procedure

Describe how the experiment will be conducted and how you partition the data into train and test sets. Identify the critical parameters to explore and determine a set of values to evaluate for each parameter]

**3. Results**

[Provide in this section all relevant tables and graphs and include necessary information (methods including equations) of what the tables and graphs contain. Do not include conjecture or analysis in this section; such belong to the discussion section.]

**4. Discussion**

[In this section you should outline the main findings from the results and, typically, illustrate your findings with example-annotated images. For this class project, in which the data set size is strictly limited, an extensive set of example images is important as this will best demonstrate how well your algorithms are working. Always show a good example where your algorithm works well. In addition give examples that demonstrate the limitations of the algorithm as these represent the most useful information to the reading audience. Were the outcomes from the experiments as predicted? If not, why not? What are the implications of the results? This is the section where you can discuss the most interesting things that you learned from doing the project. Consider how to make this interesting for the reader]

**Conclusion**

[Include here a brief summary of the main points of your project including the experiments conducted and the significant findings from their outcomes. Future work may be suggested here.]

**References**

[A list of references that you used in your project. Make sure to use full references including all authors (unless more than six) title, journal, date and page numbers. If a reference is only available as a URL then include a description with it indicating what the URL information contains and, if possible, when it was posted. Submit pdf copies of impotant references to blackboard.]

**Program Documentation**

[EACH program or script that you developed for your project needs to be included in your report. Provide a description of each program that includes the algorithm implemented and the input parameters (see the Program Documentation link for documentation details) and also include the program source code.

**Program Code**

[Include source code for ALL programs and scripts used in the project. **For the program source code make sure that the text is commented and is presentable for the page width that you are using; do not let very long lines wrap around such that the program is not readable**. ]