CMPM 163 Notes

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Guest Speaker: Javier Villegas

- There is an approach to audio processing called **analysis and synthesis** - Using the parameterized results of the analysis of of a signal to synthesize a result from another.
- This approach can also be applied to video processing
- Fundamentally, this approach takes advantage of the human brain's penchant for detecting patterns
- There also exists the problem of **temporal coherence** - There needs to be some interpolation or smoothing between two different frames in a real-time video, due to signal noise or other video artifacts
- Solving the **temporal coherence** problem is often a question of weighing sub-optimal matching - how much informational decoherence from the original source is acceptable
- Another solution is a **gradient-based approach**, an image is fed into a surface gradient evaluator, which is then interpreted as a vector field. This vector field can be smoothed and interpolated to achieve the desired results
- Furthermore, a **template-matching** algorithm can be used to find a best-match from a map of known vectors, and render the value mapped to that key bucket
- Global or local histogram equalization of the luminance of the image can be used to identify regions of interest
- Derivatives of the movement delta of individual points-of-interest can also be used for interesting effects
- The center of mass of a field of pixels can be tracked and used as a data point for influencing other effects