Updates: Friday, January 28, 2022  
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**1.1 MER Canvas Page Checklist – Pending action items:**

1. Github username sent to Prof – yet to receive content
2. Mendley Account – done - how to use it??
3. Requested for physical Key – request approved – will collect today

**1.2 MER Canvas Page Additional Materials:**

1. Robotics worldwide mailing list: link is not working

**2 Updates:**

*Variable-Friction Finger Surfaces to Enable Within-Hand Manipulation via Gripping and Sliding (2018):*

1. Biological Inspiration, Finger Properties, VF
2. 2DoF gripper, read About Control approach and implementation
   1. Control: non-linear behavior was observed, added feedforward term (function of

the current angle of the VF), open loop

1. Watched the video linked in the application for more clarity (9 different applications)
2. Future work: Multiple/asymmetric objects, closed controller, underactuated, higher DoF

*Within-Hand Manipulation Planning and Control for Variable Friction Hands (2021):*

1. Presented 3 vision-based within-hand manipulation methods for a variable friction hand, taken some cases/assumptions
2. Feedforward: weighted A\* with modified cost func, can be used in cases when smooth and fast executions are required and when
3. the accuracy is not a major concern
4. Feedback: provide high accuracy without requiring any planning, but it can cause chattering
5. Hybrid: combines advantages of FF+FB(requires planning, but can provide smooth trajectories and accurate results)
6. Future Work: ??Not Specified??

*Region-Based Planning for 3D Within-Hand-Manipulation via Variable Friction Robot Fingers and Extrinsic Contacts (2021):*

1. Start and goal area
2. Pivoting
3. Watched video – link in MER lab application form
4. Motion Planning Problem formulation
5. cost function: minimize the contact region that is left outside of the goal region
6. Future Work: Variable Palm Width, larger/smaller objects, enabling sliding/ rotation for thin prisms

**3 Additional Information:**

1. Talked to Chintan, gave us the overview of his work, discussed some ideas
2. Referred slides: Dexterous Manipulation (WIP)
3. Started reading Joshua’s thesis (WIP)
4. Visited Yale Openhand Project – read/analyzed different hand designs

**3.1 Dexterous Manipulation Slides:**

1. Power Grasping (Prehensile-1finger, non-prehensile-2fingers), Precision Grasping
2. Grasp Matrix: relation between object twist & twists of contact points on object
3. Hand Jacobian: relation between joint angles & contact velocities

**Questions:**

1. Sources/links to control laws for each paper or maybe some flowchart
2. Understand the aim/target of what we aim to achieve
3. Short term goals: Weekly/Monthly

**Meeting Notes/Suggestions:**