

Student Presentations – Round 2

Guidelines for Presentations: Once again, form groups. Every group member should actively participate in making sense of the statement and proof (though it is not necessary that everyone be active in presenting it). Since the proofs are provided in the paper, you should pay attention to filling in gaps and/or pointing out why the argument flows. (Of course, you may find a better proof than that provided.)

The target date for presenting these is Friday, July 14 (subject to change!)

I've outlined 5 presentations...I don't think any one is significantly harder than another, though some are shorter.

Presentation 1: Ohta/Ono Lemma 1. Included below is Nadler's statement, proof and a remark. The notation is slightly different than that in the Ohta/Ono paper: $E(a, b)$ is exactly the medial map in Ohta/Ono and $(X, d) \in UEP$ means the metric space X with metric d has the UMP.

Nadler Lemma 2.1. If C is a nondegenerate connected subset of $(X, d) \in UEP$, then $E([C \times C \setminus \Delta]) \subset C$.

Proof. Assume $a, b \in C$ such that $a \neq b$. Define $f : C \rightarrow \mathbb{R}^1$ by $f(y) = d(a, y) - d(b, y)$ for each $y \in C$. Clearly f is continuous and $f(a) < 0$ while $f(b) > 0$. Hence, since C is connected, there exists $y_0 \in C$ such that $f(y_0) = 0$, i.e., $d(a, y_0) = d(b, y_0)$. Therefore $E(a, b) = y_0 \in C$.

REMARK. Lemma 2.1 implies UEP is inherited by connected subsets.

Presentation 2: Ohta/Ono Lemmas 3 and 4.

Presentation 3: Ohta/Ono Lemma 5.

Presentation 4: Ohta/Ono Theorem 1.

Presentation 5: Ohta/Ono Theorem 2.