Suggestions for Revised Measure Paper

Abstract

1. The sentence

   When $X = \ell_m$ is an ... is awkward in that you are both defining a term and using it.

   Let ℓ_m be m points in a line where each adjacent pair is one inch apart. Tsaturian showed ....

2. IF the following is true then say it:

   We first prove our results for measurable colorings. We then use XXX to eliminate the measurable restriction.

1 Introduction

1. Page 2. You say that in 1979 Erdos and Graham claimed $\mathsf{E}^2 \not\to (\ell_2, \ell_m)$ for some $m < 10^7$ but gave no proof. This leaves the reader wondering if its true and did they prove it. You later (after Theorem 1) discuss the issue. You should say that you WILL discuss whats known about $\mathsf{E}^2 \not\to (\ell_2, \ell_m)$ after Theorem 1.

2. Page 3. *For problems involving a red ℓ_4, Erdos, Graham, Montgomery, Rothchild, Spencer and Strauss prove $\mathsf{E}^d \not\to (\ell_6, \ell_6)$ and $\mathsf{E}^d \not\to (\ell_4, \ell_4, \ell_4)$ for every $d \geq 2$.*

   The first result is not about red ℓ_4. Did you mean something else?

3. Lots of comments about Theorem 9 since I really want to understand it and teach it in my class.

   (a) Section 1.3 should be its own big Section. Its a real proof!

   (b) The proof refers to Figure 1 but I could not find Figure 1. What is a *lattice strip*?

   (c) What does it mean to be *nonnegative locally for every coloring avoiding the forbidden configuration*.

   (d) You use the notation ℓ_{2^S} and ℓ_{7^S}. What is S?

   (e) *We construct a quadratic polynomial L such that $L \geq 0$ whenever the strip contains no red ℓ_2 and no blue ℓ_7.*

   How many variable in the poly?

   What does this sentence mean? The poly is ≥ 0 WHERE? On the strip? On all points of the strip. So do you mean the following:

   (f) *We construct a quadratic polynomial $L(x, y)$ such that if the strip contains no red ℓ_2 and no blue ℓ_7 then for all (x, y) on the strip, $L(x, y) \geq 0$.*

   (g) What is $\overline{Q}$? If its the complement of Q then $F = \overline{Q}$.

   (h) F might not be a good variable to use since I think Field. If you need to use I for Irrational.

(i) This item will show by lack of knowledge. I doubt it will lead to that many changes in the paper. The audience of Discrete Analysis probably knows most of the terms. BUT see my last point for thoughts on our long document.

χ is the space of such colorings. What does it mean for this space to be compact? What is the topology on that space?

What does it mean for a group to be solvable? amenable?

What is a Folner Sequence?

What is Prokhorov's theorem? Bohner's theorem?

(j) Picking a polynomial and getting a contradiction- is that your idea or was that a known technique?

(k) I thought you would prove the theorem for measurable colorings and then have a theorem that says if its true for measurable colorings its true for all colorings. You didn't do that. Could you structure the proof that way? It would be cleaner.

(l) Page 5. *Not every character of* F_2 ... I thought F_2 was a subset of R. I am probably wrong.

(m) What is a Haar measure?

(n) Making one of the chapters of the long document your article is not plausible. The book is mostly elementary. However, if you can do a full proof of Theorem 9, using various theorem as black boxes, that would be great for the long document. That chapter can also point to your article and state the results in it.

4. I stopped reading here.