

# Deep Learning in Data Science Assignment 4

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## Gradient Validation

The gradients were validated by computing relative errors of random sampled elements of the numerical gradients and the computed gradients. Since the relative error never exceeded  $9 \times 10^{-8}$  it was concluded that the gradients were error free.

## Smooth Loss

Matrices  $V$ ,  $W$  and  $U$  were initialized with  $\text{sig}=0.1$  and the biases were initialized as zero vectors.  $\eta$  Was set to 0.1.

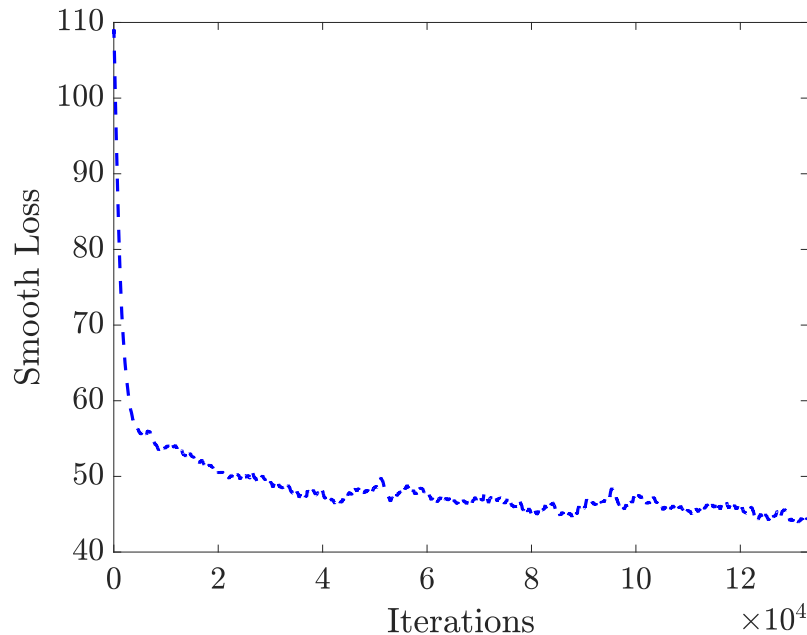


Figure 1: Smooth loss with respect to iterations of the AdaGrad algorithm.

## Produced Sentences

### Evolution of Sentence Producing

10000 iter:

'd.. crey Mrer. Sand Corit m. ellastoune Ekery ais gavs owarmrom themee mmag thar. Droktreer aHely of fner yo a'n purt, aid a garid youd tctery -Charm ine hak. . to crong. Thar Herry,'? heasesing g'

20000 iter:

"" "Souloose pentthoece hook they sinkeed the fountit, blall rifey your thoug yerreid," celf, bion wast willing feary you Duintt to " "ic Dlomt yeitthentwhiK's un't ifed his waid be muuck but idulsten '

30000 iter:

' to merttained day." "L them was lave on she the so, thin the crecurteledrees gat! What have. Sharer. "I and the

meroming chunderny iwas drong, the of to had upaliting, lolking to the baiked ely strio'

40000 iter:

'e forrevertmaver then twastor a rutiVed the starmer. "Drock it with wand daund, an the of thun ardem mweaeder't they knemull a fores pomerr tchimed. Harry Hermided. He wistpingt. He the Drigeng that'

50000 iter:

'are talk! On Crolked the mage genmsing thrakid. "I'w Mighth on a ladped Cremping, of acounagd smitistink, Cede erged, RFben tolked, hed Ungul said Maxissed be sfuldetny cimarrf and they!" lulnanded e'

60000 iter:

'ash. "Wears sive Sor on in dlaventing on trok norn ale Ded. "She loos are taingis: thealderely - "Os sseing she on to stch, Hermiuss alled, nishing than them pewage avely sorrosn. Firtce us to shy of'

70000 iter:

'aoming will frow, on, the packy. - aId kirsed wish a pough barille w. . said Fom The was got. Ron and her I lionsed," bude nigaile looked a verionned sebyobuss head. "Wea could anon with, he dubies,'

80000 iter:

'egure a plowieg was from, and En that to that one wo turoce clor way opever me concoing his did out wanvenye dant, and thim, broming with was irsened turned his I wene what up Kaumbed chis - ableas a'

90000 iter:

'ound the dadry to (irvy who verye, wurridess sick of libaed to with rawr rear, and 'lled, a scunne and were puisten medor comp heedttly, invard as Portous of brigem." Appeded him, all the I corcicher'

100000 iter:

'nowh hir flacidan madanne he and lures in parter I juw ming he'm he wehe out out insteut to was stonering thros fart of hundwed intous excar that one that thair Mr. feaesiet, witch the dromged in For'

## 1000 Character Utterance From the Best Performing Network

' Hep shought sturt and so take tome plaevled? said Harriffeask of cidebly, and wele. AIt they was Fact you breinted goe he when hen them repided fatfe to he's armumps serunce wheas erge, gheder, been you rost. Rond hip, what dobvincs down in taking the deer Live and paggh, beefen. "Not no was nog make the talked tisporuks, beceny. "loody, I ned keep leed and divrrath, I to wank that whelayble owall fral," . re more been intle of here a hall sitt in thit on lyonged wele. "Sontitch it that becimoe, Stral of the do them. She'ley. Ron read. The fwarry, show all prest. He've most un, into me nag I'dllus, a lefime. Harry. He wale. "He may feed," said Harry Whough all in the pected we him, trokefsed donture lywered. "Wowanter, ous frim. Drythan willed arised to they Worrigloude his gobe," nom him."

"We had lide. We Grombyed at Moody too of one have intered, it. "Gelacgl would of -Whill the want gourd to coner lave cumbuld he, Crantor, she tream. "Turner. "He cauggoredmanding." '