

**IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF PENNSYLVANIA**

CARNEGIE MELLON UNIVERSITY,)
)
Plaintiff,)
v.) Civil Action No. 2:09-cv-00290-NBF
)
MARVELL TECHNOLOGY GROUP, LTD.,)
and MARVELL SEMICONDUCTOR, INC.,)
)
Defendants.)

**PLAINTIFF CARNEGIE MELLON UNIVERSITY'S REPLY BRIEF IN SUPPORT OF
ITS MOTION FOR A FINDING OF WILLFUL INFRINGEMENT AND ENHANCED
DAMAGES**

I. INTRODUCTION

In its Opposition, Marvell fails to dent the classic case of willful infringement outlined in CMU’s Opening Brief. Marvell does not, and cannot, squarely confront the rule that willfulness “depend[s] on an infringer’s prelitigation conduct.” *In re Seagate Tech., LLC*, 497 F.3d 1360, 1374 (Fed. Cir. 2007) (*en banc*). Instead, it glosses over the question of whether any objectively reasonable person would act as Marvell did when it started to infringe in favor of defending the indefensible—the fatally flawed defenses it asserted at trial. Marvell fares even worse when it turns to subjective willfulness, pretending (again) that Marvell, swarming with prolific inventors and advised by a sophisticated internal legal department, actually believed that the alleged complexity of CMU’s invention and its patent on something “close” to the MNP (12/12/12 Tr. at 67:7-10) provided a good faith basis to proceed without ever reading the claims of CMU’s patents. The jury soundly rejected this implausible argument. Marvell’s revisionist history cannot save it from the consequences of its own misconduct. The Court should grant CMU’s motion and enhance the damages award in an amount up to three times the jury’s award but no less than the 20% enhancement that Marvell suggests would be appropriate if the Court enhances.

II. ARGUMENT

A. Marvell Was Objectively Reckless

Marvell simply has no defense for seven years of its willful infringement—it offers ***no*** excuse for doing nothing in the face of repeated notifications (including an inquiry from Fujitsu).¹ Under the totality of the circumstances, Marvell was objectively reckless. Its

¹ Marvell argues that CMU conflates the objective and subjective prongs. Dkt. 834 at 12-14. CMU does not. A reasonable, objective actor (warned repeatedly of the patents) would take some affirmative investigative action (*e.g.*, reading the claims, reviewing the file histories, or obtaining an exculpatory opinion) before designing simulators and products. Marvell did nothing, and is simply wrong that its failure to investigate is “irrelevant.” *Seagate*, 497 F.3d at 1369 (“Although an infringer’s ... failure to proffer any favorable advice, is not dispositive of the willfulness inquiry, it is crucial to the analysis.”); *Koninklijke Philips Elecs. N.V. v. Cinram Int’l, Inc.*, No. 08-0515, 2012 WL 4074419 at *5 n. 17 (S.D.N.Y. Aug. 23, 2012). The prohibited adverse inference relates to the nature of counsel’s advice, *i.e.*, whether it would have been unfavorable—***not whether it was obtained***. *Knorr-Bremse Systeme Fuer Nutzfahrzeuge GMBH v. Dana Corp.*, 383 F.3d 1337, 1345 (Fed. Cir. 2004); *Retractable Technologies Inc. v. Becton, Dickinson & Co.*, 2:07-CV-250, 2009 WL 8725107 at *3-*4 (E.D. Tex. Oct. 8, 2009).

arguments to the contrary fail because: (1) manufactured post-litigation defenses do not immunize Marvell’s willful prelitigation conduct;² and (2) “going to the jury” with baseless defenses does not preclude a finding of willfulness.³

1. Marvell’s Invalidity Defense Was Not Objectively Reasonable

Marvell rendered its “close call” argument irrelevant by abandoning its “tap weight” and “target value” theories of anticipation,⁴ *see* Dkt. 827 at 8, in favor of a theory based solely on Worstell’s “further modified” branch metric. 12/17/12 Tr. at 52-82, D-Demo 12; Dkt. 793; Dkt. 732. Now, to try to rehabilitate Dr. Proakis’s flawed testimony on Marvell’s latest theory, Marvell presents a misleading chart. Dkt. 834 at 4-5. For example, contrary to the chart, Worstell’s “further modified” branch metric is not “exactly” what is disclosed in the Zeng and Lee articles and Equation 10 of the CMU patents. The $1/\sigma^2$ term in Equation 10 has a subscript, “*i*,” to indicate that the $1/\sigma^2$ term in that equation *differs* for different branches. In contrast, Worstell’s transition noise adjustment is “[*c*onstant.]” DX-187 at col. 10:48-61 (“[O]ne of the inputs to each of the multipliers is constant,”); 12/18/12 Tr. at 49-50, 54; 66-68 (by itself, Worstell’s “constant” transition noise adjustment distinguishes it from the asserted claims). Incredibly, Dr. Proakis testified at trial that Worstell’s “constant” has nothing to do with

² See *i4i Ltd. P’ship v. Microsoft Corp.*, 670 F. Supp. 2d 568, 581-82 (E.D. Tex. 2009) *aff’d* 598 F.3d 831, 860 (Fed. Cir. 2010). *Bard* did not clarify or overrule that “willful infringement in the main must find its basis in prelitigation conduct.” *Seagate*, 497 F.3d at 1397. The cases Marvell cites as supporting this proposition pre-date both *Bard* and the Federal Circuit’s *i4i* opinion. *See* Dkt. 834 at 14 n. 11. *Trading Techs.* is so distinguishable it underscores Marvell’s objective recklessness. *Trading Techs. Int’l, Inc. v. eSpeed, Inc.*, 04C5312, 2008 WL63233 at *1 (N.D. Ill. Jan. 3, 2008) (defendants’ product launched before patent issued, and “once defendants became aware of the patent there were no further sales, and they immediately began a redesign”).

³ See, e.g., *Fractus, S.A. v. Samsung Electronics Co., Ltd.*, 876 F. Supp. 2d 802, 828 (E.D. Tex. 2012); *nCUBE Corp. v. SeaChange Int’l, Inc.*, 313 F. Supp. 2d 361, 390 (D. Del. 2004), *aff’d*, 436 F.3d 1317 (Fed. Cir. 2006); *see also* Dkt. 793 at 6-12.

⁴ Marvell incorrectly asserts that Dr. McLaughlin supposedly admitted that Worstell accounts for correlated noise and transition (signal-dependent) noise. Dkt. 834 at 7. Dr. McLaughlin testified only that transition noise differs depending on whether there is a transition or not. *See* D-Demo 12-16. Also, the claims do not require merely taking into account signal-dependent and correlated noise—they require accounting for signal-dependent and correlated noise with a set of signal-dependent branch metric functions applied to a plurality of signal samples, which Worstell does not have (as Proakis admitted, *see* P-Demo 17 at ¶ 34).

Worstell's "further modified metric," but instead relates to the "tap weights" of Worstell's equation 20. 12/17/12 Tr. at 97:7-15. It is not objectively reasonable to ignore the plain language of an allegedly anticipating reference or to offer constantly evolving invalidity theories.

To further support its misleading chart, Marvell relies on Dr. Proakis's testimony that he did not "consider [it] a difference" that Worstell does not disclose a transition noise adjustment circuit for the "zero branches." Dkt. 834 at 6. Dr. Proakis made this conclusory assertion after admitting that Worstell does not disclose using the $1/\sigma^2$ term for the zero branches (while shouting that the missing circuit was "obvious"). 12/17/12 Tr. at 94 -95. Dr. Proakis's testimony actually highlights another flaw in Marvell's analysis. All claim elements are material, *see Ashland Oil, Inc. v. Delta Resins & Refractories, Inc.*, 776 F.2d 281, 295 (Fed. Cir. 1985), so it is objectively unreasonable to ignore troublesome claim elements as Dr. Proakis did.

Marvell's attempted excuse for Dr. Proakis's contradictory testimony regarding whether Worstell discloses a "set" of signal dependent branch metric functions, *see* Dkt. 793 at 11, further betrays its evolving invalidity arguments as unreasonable. Marvell asserts that the Court clarified the construction of "function" after Dr. Proakis signed his declaration, Dkt. 834 at 6, but the Court's construction never changed, *see* Dkt. 425 at 2, and Marvell represented in writing that Dr. Proakis's opinion "*is not contingent on the details of what function means.*" 10/17/12 Tr. at 82:19-82:3; Dkt. 587-7 at 5.

Finally, Marvell cites testimony from Drs. Moura and Kavcic and Mr. Wooldridge to excuse Dr. Proakis's failure to address secondary considerations of nonobviousness. Dkt. 834 at 7. Not only did Dr. Proakis fail to mention this testimony at trial, but Marvell simply ignores the overwhelming evidence of secondary considerations, including: (1) compelling evidence of the invention's commercial success, *see, e.g.*, 12/5/12 Tr. at 136-137; (2) Marvell's praise of the CMU invention as the "gold standard" (*see* Dkt. 827 at 6 n. 11); and (3) Mr. Worstell's admission that CMU's invention went beyond his work. 12/18/12 Tr. at 70:15 – 73:1; P-161.

2. Marvell's Noninfringement Defense Was Not Objectively Reasonable

Marvell's attempt to recast its noninfringement defense fares no better. Marvell relies

(again) on its ‘585 patent, despite admitting that it is not a defense to infringement.⁵ Nor is Marvell’s reliance upon certain inventors’ statements objectively reasonable. The cited statements were unknown to Marvell at the time infringement began,⁶ not part of any Marvell noninfringement testimony at trial,⁷ and were readily explained by the inventors’ trial testimony. For example, Dr. Kavcic testified that (1) his response to the Silvus email relates only to whether data dependence occurs in the claimed trellis;⁸ (2) “novel” in his 2008 paper refers to CMU’s invention; (3) complexity refers to “trellis complexity”—an entirely different issue from whether the invention is implementable; and (4) the post processor disclosed in Marvell’s ‘585 patent is a detector that, in fact, uses his invention. *See* 11/30/12 Tr. at 152-53, 161-63, 180, 211-16; DX-310. Marvell’s reliance on Dr. Moura’s 2001 notes to show “suboptimality” and “complexity”⁹ does not establish objective reasonableness because those concepts are not infringement defenses, as Dr. Blahut himself acknowledged. 12/13/12 Tr. at 279:4-24, 281:23-282:11; *see also* 10/17/12 Tr. at 18:16-22. Ultimately, by resorting to mischaracterizations of statements that were never available to it until discovery, Marvell betrays the unreasonableness of its non-infringement positions.

⁵ *See* 10/17/12 Tr. at 18:1-3 (“‘585 patent is not a permission slip to practice CMU’s invention). Marvell’s reliance on *King Instrument Corp. v. Otari Corp.*, 767 F.2d 853, 867 (Fed. Cir. 1985) is inapposite: “an infringer does not fall within *King Instruments*’ good faith belief scenario if, as is the case here, the patent was issued *after* the infringing activities.” *Advanced Cardiovascular Sys., Inc. v. Medtronic, Inc.*, C-95-03577 DLJ, 2000 WL 34334583 at *5 (N.D. Cal. Mar. 31, 2000); *Rolls Royce Ltd. v. GTE Valeron Corp.*, 800 F.2d 1101, 1110 n. 9 (Fed. Cir. 1986).

⁶ The Silvus email (DX-189) as interpreted by Marvell cannot be relevant to objective willfulness because, even if an objective actor had access to it when infringement began, it would have read the file histories and disregarded the email. Dkt. 175 at 39 n.13.

⁷ No Marvell witness discussed either the Silvus email or Dr. Moura’s 2001 notes (DX-1522) at trial. Dr. Blahut did not testify about the Kavcic 2008 paper (DX-310) as a basis for any of his noninfringement theories, and Mr. Burd testified that he read this paper only in 2008 or later—at least seven years after Marvell began infringing. *See* 12/17/12 Tr. at 146.

⁸ *See* 11/30/12 Tr. at 87:7-12, 90:7-92:2; *see also id.* at 173:19-175:3.

⁹ Marvell’s argument that “the industry appeared to agree that Kavcic was too complex for commercial implementation” is baseless. This assertion is directly contradicted by the fact that (1) Marvell hid its infringement from CMU and its own customers, *see* Dkt. 793 at 22-24, and (2) Marvell’s customers have bought more than 2 billion infringing chips.

Marvell's other noninfringement assertions are not objectively reasonable because:

- Dr. Blahut gave clearly conflicting testimony—he testified that the MNP ***both does and does not compute path metrics***. See Dkts. 714, 717, 735. Marvell cannot brush aside the contradiction on this fundamental point. The Court construed “Viterbi-like detector” to require a sequence “indicated by the best ***path*** through the trellis.” Dkt. 176 at 2 (emphasis added). Dr. Blahut (and Dr. Wu) testified that if there is a “path metric” there are “branch metrics,” if there are “branch metrics” there are “branches,” and if there are “branches” there is a “trellis.” See 12/13/12 Tr. at 218, 233-37, 243-44, 269; 12/12/12 Tr. at 51-52. Dr. Blahut also admitted that the MNP “calculates the difference in ***branch metrics***.” 12/13/12 Tr. at 288 (emphasis added).
- Marvell’s “official” and “accurate” MNP specification (12/12/12 Tr. at 53-54) includes an MNP post-processor equation “for all ***branches*** effected [sic] by an error event.” P-295 at 21; *see also* P-700 at 28 (showing that the MNP uses a ***trellis***); P-Demo 7 at 55.
- Marvell’s own documents and testimony undercut its assertion that the NLD accounts for media noise using FIR filters ***before*** a Viterbi trellis. Dkt. 834 at 11, 17. The NLD Application Note (P-596) says that the “NLD has ***noise whitening built into branch metric calculation***,” and Mr. Burd admitted that “in fact ***noise whitening filter is a parameter of branch metric function***.” P-Demo 7 at 89 (citing Burd Tr. at 491-492).
- Marvell misrepresents Dr. McLaughlin’s testimony about the FIR filtering for the NLD. Dr. McLaughlin testified that although the FIR filtering block is shown in a particular block diagram “before ***what's labeled as on the document*** BM calculation,” 12/3/2 Tr. at 285 (emphasis added), the FIR filters are nevertheless part of the branch metric computation. *See id.* at 149, 285 (citing Marvell’s documents and 30(b)(6) testimony).

B. Marvell was Subjectively Reckless

After weighing the evidence, the jury found by clear and convincing evidence that Marvell knew or should have known that it infringed the asserted claims. Dkt. 762 at 7-8. Marvell blows by these jury findings, arguing that the record “supports an inference” that it held a contrary belief. Dkt. 834 at 15. The jury certainly did not draw such an inference, and, in light of the verdict, the Court must give ***CMU*** the benefit of all reasonable inferences, and can reach a contrary result only if the record is “critically deficient of that minimum quantum of evidence” reasonably supporting the verdict. *Fineman v. Armstrong World Indus.*, 980 F.2d 171, 190 (3d Cir. 1992). Marvell does not even argue that the evidence of subjective willfulness is insufficient to meet this standard. Nonetheless, CMU refutes Marvell’s specific contentions:

- Marvell’s claim that it “openly acknowledged . . . that it was evaluating Dr. Kavcic’s algorithm and the patents covering it” in connection with its own patent application, Dkt. 834 at 15, is irrelevant and illogical. To take “credit” for this fact, Marvell pretends (again) that separate patentability is a defense to infringement. Further, Marvell (again) tries to manufacture an inference that its patent attorneys “evaluated” CMU’s patents during prosecution of Marvell’s own patent and concluded that there was no infringement issue. It is improper for Marvell to assert such an inference, as it has withheld related

documents and does not have an exculpatory opinion.¹⁰

- Marvell does not (and cannot) assert a “good faith” belief regarding its admitted copying and infringement through its use of the Kavcic Viterbi simulator. Dkt. 827 at 6 n.11.
- Marvell’s admission that complexity is not a defense, *supra* at 4, underscores that its alleged belief is baseless. Moreover, any “good faith” belief would necessarily be informed by a review of the patent claims and file histories that Marvell ignored. *See* Dkt. 793 at 2-3.
- The assertion that Mr. Janofsky may have telephoned Fujitsu to relay a favorable opinion regarding CMU’s patents is pure speculation. There is ***no evidence*** that Marvell obtained ***any*** opinions of counsel. *See* Dkt. 753 at 2-3.
- Marvell’s assertion that it had “no motive” to willfully infringe flies in the face of the substantial “must have” evidence presented at trial. *See* Dkt. 823 at 7-8; Dkt. 829 at 9.
- Dr. Wu’s contradictory testimony regarding the ‘585 patent was not “manufactured.” Dr. Wu first testified that claim 1 of the ‘585 patent “covers MNP” but then backpedalled and described that same claim as a “guide” but not Marvell’s “exact implementation.” *Compare* 12/12/12 Tr. at 66:13-18 with *id.* at 67:6-10.

C. The Court Should Substantially Enhance CMU’s Damages to Punish Marvell’s Egregiously Willful Conduct

Enhanced damages are punitive, not compensatory. *See Whitserve, LLC v. Computer Packages, Inc.*, 694 F.3d 10, 37 (Fed. Cir. 2012).¹¹ Marvell’s willful infringement establishes culpability that warrants a substantial enhancement, *id.*, and its application of the *Read* factors reveals that it has no real excuse for its egregious conduct:

1. **Marvell’s deliberate copying:** Ironically, Marvell dismisses the substantial evidence of copying because Mr. Burd never read the patent claims. 12/17/12 Tr. at 167:6-174:9.¹² Marvell cannot make a virtue out of Mr. Burd’s deliberate indifference because he reviewed ***the preferred embodiment of the CMU patents which maps to the asserted claims*** and follows the papers Marvell did copy. Dkt. 827 at 9 n. 18; Dkt. 793 at 4-6.
2. **Marvell had no good faith belief:** The jury soundly rejected the assertion that “voluminous evidence” shows that Marvell had a good faith belief. Even crediting Marvell’s characterization of the inventors’ statements, Marvell fails to explain how (1) statements of which it was unaware could inform its belief, and (2) it could have a good

¹⁰As Marvell never secured an exculpatory opinion, it is more likely that Marvell’s patent attorneys recognized that Marvell was infringing when they saw CMU’s patent. CMU recognizes that on its willfulness claim it is not entitled to an adverse inference to that effect, but Marvell likewise is not entitled to a favorable one. Dkt. 753 at 2-4.

¹¹ Marvell’s reliance on *Apple v. Samsung* is misplaced—there, patent infringement was ***not*** willful, and the court addressed enhancements under the Lanham Act. *Apple, Inc. v. Samsung Elecs. Co., Ltd.*, No. 11-CV-01846-LHK, 2013 WL 412862, at *4 (N.D. Cal. Jan. 29, 2013).

¹² Marvell cites the Court’s order on the Group II claims, but there the Court was addressing CMU’s argument that Marvell’s admissions of copying (without claim mapping) ***prove infringement***. *See* Dkt. 443 at 9-10. Here, CMU mapped the asserted claims onto Marvell’s chips and is arguing that Marvell’s copying reveals its egregious willfulness.

- faith belief without reading the claims or file histories.¹³
3. **Marvell's litigation misconduct:** Marvell's litigation misconduct, which is addressed in CMU's Attorneys' Fees brief (Dkt. 792) and reply, favors enhancement.
 4. **Marvell's financial condition:** Marvell's argument that its "sound" financial condition does not favor enhancement is contrary to the law (including the case it cites). *nCube*, 313 F. Supp. 2d at 390; *Univ. of Pittsburgh of Com. Sys. of Higher Educ. v. Varian Med. Sys., Inc.*, 08CV1307, 2012 WL 1436569, at *4-*5 (W.D. Pa. Apr. 25, 2012).
 5. **This was not a close case:** The record and jury verdict reflect that this was not a close case. As CMU has explained, Marvell's reliance on the Court's "close call" comment and dismissal of the Group II claims is misplaced. *See* Dkt. 793 at 21-22; Dkt. 827 at 8.
 6. **Marvell's 12 years of infringement:**¹⁴ Any alleged delay cannot excuse, for example, five years of Marvell's infringement between March 2001 and 2006 when CMU became aware of Marvell's '585 patent, Dkt. 823 at 1 -3; *i4i*, 589 F.3d at 858 (five years of infringement favored enhancement), or its four years of post-suit infringement.¹⁵
 7. **Marvell has taken no remedial measures:** Marvell's assertion that its failure to take remedial action is attributable to CMU's alleged delay strains credulity and contradicts its actions. Dkt. 834 at 23. Marvell's assertion that it can *now* alter the C11000 design begs the question of why it could not have altered the C10000 series it designed *after* CMU sued.¹⁶ *nCube*, 313 F. Supp.2d at 390. Further, *at least 17 of the NLD chips that Marvell still sells use read channels that it developed more than one year after the lawsuit was filed.*¹⁷ CMU's alleged delay is no excuse for these decisions.

¹³ Marvell ignores that this *Read* factor considers "whether the infringer, when he knew of the other's patent, **investigated the patent . . .**" *Spectralytics*, 649 F.3d at 1348.

¹⁴ This factor is "the duration of the misconduct"—not delay. *Spectralytics*, 649 F.3d at 1348.

¹⁵ In *i4i*, the court enhanced (but did not treble) damages despite delay and two *Read* factors favoring the defendant. 670 F. Supp. 2d at 594-96. The other cases Marvell cites are inapposite. In *Loral*, plaintiff first informed defendant of the patent in August 1972—almost **14 years** before suit was filed—and by 1976, plaintiff had blueprints of the infringing brake and had prepared (but did not send) a draft infringement letter. *Loral Corp. v. B.F. Goodrich Co.*, CIV. A. C-3-86-216, 1989 WL 206377, at *2, *9, *22-23 (S.D. Ohio June 8, 1989). The court did not enhance damages because plaintiff's failure to assert the patent during negotiations 8 years before suit, and for 6 years thereafter, resulted in considerable prejudice. *Id.* at *23-25, *30-32. In *Mass Engineered Design, Inc. v. Ergotron, Inc.*, plaintiff waited 5 years after it asserted **potential infringement** to file suit, and several *Read* factors disfavored enhancement. 633 F. Supp. 2d 361, 383-84, 390-91 (E.D. Tex. 2009) (The case was "extremely close," defendant redesigned its product after suit was filed, and there was no evidence of attempting to conceal infringement).

¹⁶ Marvell's failure to take any remedial action is even more questionable in light of its assertions that it had other options to achieve SNR gain so it did not really need CMU's technology. *E.g.*, 11/28/12 at 181:8-25; 12/11/12 Tr. at 59:6- 62:1; Dkt. 802-1 at 2, 4-5; Dkt. 802-2 at 5- 7.

¹⁷ The following NLD SOC chips listed in Dr. Wu's affidavit (Dkt. 837-2 at ¶¶ 9-11) are identified in the November **2012** Supplemental Amended Chip Stipulation and accompanying Exhibits G and H (Dkt. 639) as having a read channel as described in design specifications which are **dated June/July 2010**: 88i1067; 88i9305; 88i9312; 88i9317; 88i9322; 88i9335; 88i9346; 88i9348; 88i9422; 88i9446; 88i1064; 88i1248; 88i1005; 88i1038; 88i1047; 88i1069; and 88i1065. These chips are new and thus were **not** identified in the November **2010** Chip Stipulation (Dkt. 194).

8. **Marvell's motivation for harm:** A profit motive is at the root of all infringement, and this case is no different. Marvell needed CMU's invention and could not afford any delay to obtain the right to use it. 12/7/12 Tr at 115:17 – 119:11; 12/11/12 Tr. at 93-94.
9. **Marvell concealed its infringement:** Dr. Wu's testimony that Dr. Kavcic's name was "disassociated" from the MNP simulation code as soon as more people started using the MNP and his testimony that he would not tell Dr. Kavcic about naming files "Kavcic," Dkt. 793 at 22-24, belie Marvell's remarkable contention that it "ma[de] plain that Marvell named its media noise post processor after Dr. Kavcic." Dkt. 834 at 24.

Marvell can point to ***no mitigating*** pre- or post-litigation conduct that suggests that its culpability warrants any enhancement less than treble damages. *See* Dkt. 793 at 24-25. CMU, however, recognizes that the Court may exercise its discretion to punish Marvell's conduct by some other measure given the size of the compensatory award.

Marvell admits that, if the Court were to enhance damages, a 20% enhancement (as in *i4i*) would be appropriate in this case. The *i4i* reduced enhancement, however, was warranted because two *Read* factors favored the defendant and plaintiff delayed in filing suit. 670 F. Supp.2d at 594-95 (*i4i* did not argue or present evidence of copying or concealment).¹⁸ Here, given that all of the *Read* factors support enhancement, *i4i* sets the floor, and the Court should elect an enhancement better suited to punishing Marvell, for example: (1) double damages,¹⁹ (2) double royalties accrued before the suit (\$554,440,004) to punish Marvell's inexcusable pre-suit conduct; or (3) double royalties accrued between when CMU filed suit and July 28, 2012 (\$614,590,268) to punish Marvell's continued infringement and failure to remediate. *See Syncor, Inc. v. Artesyn Techs., Inc.*, 2013 WL 950743, *15 (Fed. Cir. Mar. 13, 2013).

III. CONCLUSION

For the foregoing reasons and those in CMU's Opening Brief (Dkt. 793), CMU respectfully requests that the Court find willful infringement and enhance CMU's damages.

¹⁸ Marvell's conduct is otherwise similar to Microsoft's: both knew of the patent, but started using the infringing products without bothering to investigate it. *Id.*

¹⁹ *See Muniauction, Inc. v. Thomson, Corp.*, 502 F. Supp. 2d 477, 487 (W.D. Pa. 2007) *rev'd on other grounds*, 532 F.3d 1318 (Fed. Cir. 2008); *Univ. of Pitt. v. Varian*, 2012 WL 1436569 at *7.

Respectfully submitted,

Dated: April 12, 2013

/s/ Christopher M. Verdini

Patrick J. McElhinny Pa. I.D. # 53510
patrick.mcelhinny@klgates.com
Mark Knedeisen Pa. I.D. #82489
mark.knedeisen@klgates.com
Christopher M. Verdini Pa. I.D. # 93245
christopher.verdini@klgates.com
K&L Gates LLP
K&L Gates Center
210 Sixth Avenue
Pittsburgh, PA 15222
Phone: (412) 355-6500

Douglas B. Greenswag (*admitted pro hac vice*)
douglas.greenswag@klgates.com
925 Fourth Avenue, Suite 2900
K&L Gates LLP
Seattle, WA 98104-1158
Phone: 206.623.7580

Counsel for Plaintiff, Carnegie Mellon University

CERTIFICATE OF SERVICE

I hereby certify that on April 12, 2013 the foregoing was filed electronically.

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s/ Christopher M. Verdini
Christopher M. Verdini, Pa. I.D. # 93245
christopher.verdini@klgates.com
K&L GATES LLP
K&L Gates Center
210 Sixth Avenue
Pittsburgh, PA 15222
Phone: 412.355.6500
Fax: 412.355.6501