

Brain Reading and Technologies that can Change Brain Activity – A Spiritual Insight

By **MATSATI** - February 20, 2021



There are a number of universities and companies working in new technology for reading the brain and/or having the capability to change brain activity. A simple survey of four research papers [1-4] published from 2017 to 2019, reveals there are 41 Universities / Companies that are actively working on this technology:

1. Korea Brain Research Institute,
2. Science and Technology Studies University of Tokyo,
3. Department of research infrastructure Japan,
4. Department of Neuropsychiatry and international research center Tokyo,
5. National institute of Neurological disorders and stroke (NIH) USA,
6. CNC Department, Stanford University, Stanford, CA 94305, USA.
7. Department of Bioengineering, Stanford University, Stanford, CA 94305, USA.
8. Department of Applied Physics, Stanford University, Stanford, CA 94305, USA.
9. Boulder Nonlinear Systems, Lafayette, CO 80026, USA.
10. Department of Natural Environmental Studies, Graduate School of Frontier Sciences, University of Tokyo, Kashiwa 277-8564, Japan.
11. Department of Molecular and Cellular Physiology, Stanford University, Stanford, CA 94305, USA.
12. Department of Psychiatry and Behavioral Sciences, Stanford University, Stanford, CA 94305, USA.
13. Howard Hughes Medical Institute, Stanford University, Stanford, CA 94305, USA.
14. Stanford Neuroscience Gene Vector and Virus Core for AAVDJ virus.
15. Clay Lacefield for advice in the behavioral setup
16. Biological sciences at Columbia University, New York City, New York, USA.
17. University of Washington, Seattle, USA.
18. Google, Mountain View, California, USA.
19. University of Science and Technology of China, Hefei, China.
20. University of California, Berkeley, USA.
21. Monash University, Melbourne, Australia.
22. Weill Cornell Medicine, New York City, USA.
23. New York University, New York City, USA.
24. University of California, Berkeley, USA.
25. University of Michigan, Ann Arbor, USA.
26. University of British Columbia, Vancouver, Canada.
27. University of Freiburg Medical Centre, Germany.
28. University of Washington, Seattle
29. Oregon Health & Science University, Portland, USA.
30. Kernel, Los Angeles, California USA
31. Massachusetts Institute of Technology Media Lab, Cambridge, Massachusetts, USA.
32. Harvard University, Cambridge, Massachusetts, USA.
33. The Hastings Center, Garrison, New York, USA.

34. University of Washington, Seattle, USA.
35. University of Wisconsin-Madison, Wisconsin, USA.
36. National Institute for Physiological Sciences, Okazaki, Aichi, Japan.
37. Bar-Ilan University, Ramat Gan, Israel.
38. University of Maryland, College Park, Maryland, USA.
39. University of Pennsylvania, Philadelphia, Pennsylvania, USA.
40. AI Now, New York City; New York University, New York City; and Google, Mountain View, California, USA.
41. National Center for Adaptive Neurotechnologies, Albany, New York.

Scientists have been studying and recording nerve cell activity from animals for decades. Recently however Elan Musk and others have expressed the desire to have a direct link between computers and the human brain. What is described in these research papers suggests in the future, tech companies and governments will have the capability of listening to our brains and even perhaps be able to reshape our thoughts and thinking.

References

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4. R. Yuste *et al.* *Four ethical priorities for neurotechnologies and AI.* *Nature*. November 8, 2017. doi: 10.1038/551159a.
5. Chakrabarti, S., Sandberg, H.M., Brumberg, J.S. *et al.* Progress in speech decoding from the electrocorticogram. *Biomed. Eng. Lett.* 5, 10–21 (2015). <https://doi-org.pitt.idm.oclc.org/10.1007/s13534-015-0175-1>

Technology is moving very fast these days, and so the advances in these areas are quickly developing. Some of the types of technologies are using these advances to change brain waves to speech, and bracelets that use nerve impulses for typing without a keyboard, and even connecting prosthetics to head-sensors allowing for prosthetics to move for paralytics, etc. The researchers are looking to be able to listen to the neural chatter in our brains and understand what is the underlying meanings, and even using AI technology to help decipher our thoughts. This kind of technology could drastically change the lives of those who have lost the use of their arms and/or legs. This technology has the capability however to be used very nefariously for bad purposes. Especially when one uses the technology to reshape our thoughts.

The idea of reading information directly from the brain has been a sought after goal of many researchers. This would be a valuable tool for those who can no longer move. This is

the end goal of this type of research. relatively recently it has been reported the capability to decode speech signals from the brain when one was unable to speak. [5] Today extracting information from the brain requires bulky head gear and intense computer processing power. The early results of this technology is that predictive algorithms make good guesses at what the brain is thinking. Scientists believe they may gain insights into how to access our neurological data by studying neurology research which may eventually lead to even the subconscious thoughts being revealed with further technological advances. There is a neurotechnology company based out of Los Angeles selling what is called a *"Kernel Flow helmet"* which uses a near-infrared spectroscopy technique, sending electromagnetic (EM) radiation through the skull and into the brain. The EM field reflects off of tissue and blood and is received on sensors that measure oxygen levels. These oxygen levels indicate where brain-nerve-cells are active providing clues to the ongoing mental processes.

Because technology is moving fast, there are people who are proposing strict laws to regulate the issues of privacy due to the proprietary nature of neural data that is in one's brain. The major issue here is there are companies who would do almost anything to get at everyone's neural data and then data mine this information for their own purposes, for profit, etc. There are also those who claim that moving forward with this technology to help people with mental illness or paralysis is an ethical imperative, and this outweighs the fear of privacy violations. Others believe that one should have the right to sell one's own neural data for a product or service, or for cash. This suggests the brain has become an asset that will generate much profit in the future once we unlock the secrets of the brain with technology.

When we lay the scientific research down alongside the Scriptures, the Spiritual Insights that we receive from this type of research is related to the development of this brain reading technology. When reading these papers, there is a certain level of expertise that is required in order to begin the research. In addition, there must be a multidisciplinary approach as no one person is capable of working in all areas simultaneously such as interpreting the neurological data, the computer algorithms, the electronic components, and hardware development, etc. A team of researchers and manufacturers are necessary in order to take advantage of a broad range of expertise. As we can see from the research papers, it will take years and years to achieve the end goal. The dreams, desires, vision of the developers will eventually come to its fulfillment. When we study the Bible, we see how the Lord God Almighty created all life and this universe. We are also told in the Scriptures that He had wisdom and understanding to do so. We read according to the book of Jeremiah an interesting perspective as the Word of the Lord came to Jeremiah in Jeremiah 1 and the Lord tells Jeremiah that before He formed him in the womb, He knew him. This speaks to the designer who has a vision of what He wants out of His creation similar to the desires of the scientific community to develop brain reading technologies.

ספר ירמיה פרק א

ד וַיְהִי דְבַר-יְהוָה אֵלַי לֵאמֹר: הַ בְּטָרָם אֲצֹרְךָ [אֲצֹרְךָ] בְּבֶטֶן יְדֻעֶתֶיךָ וּבְטָרָם תֵּצֵא מִרְחֹם הַקִּדְשִׁיתֶיךָ נִבְיָא לְגוֹיִם נִתְתִּיךָ: וַ אֲמַר אָהָה אֲדַנִּי יְהוָה הִנֵּה לֹא-יְדַעְתִּי דְבַר כִּי-נֶעַר אָנֹכִי: ז וַיֹּאמֶר יְהוָה אֵלַי אֶל-תֹּאמַר נֶעַר אָנֹכִי כִי עַל-כָּל-אֲשֶׁר אֲשַׁלְחֶךָ

תִּלְךָ וְאֵת כָּל-אֲשֶׁר אֶצְוֶה תִּדְבֹר. ח אֶל-תִּירָא מִפְּנֵיהֶם כִּי-אֲתָרָךְ אֲנִי לְהַצִּילָךְ
נְאֻם-יְהוָה: ט וַיִּשְׁלַח יְהוָה אֶת-יְדוֹ וַיַּגַּע עַל-פִּי וַיֹּאמֶר יְהוָה אֵלַי הִנֵּה נֹתְתִי דְבָרִי
בְּפִיךָ. י רְאֵה הַפְּקֹדֶתֶיךָ / הַיּוֹם הַזֶּה עַל-הַגּוֹיִם וְעַל-הַמַּמְלָכוֹת לְנֹתוֹשׁ וּלְנָתוּץ
וְלְהֶאֱבִיד וְלְהַרוֹס לְבָנוֹת וּלְנָטוּעַ:

JEREMIAH 1:4-10

1:4 NOW THE WORD OF THE LORD CAME TO ME SAYING, 1:5 'BEFORE I FORMED YOU IN THE WOMB I KNEW YOU, AND BEFORE YOU WERE BORN I CONSECRATED YOU; I HAVE APPOINTED YOU A PROPHET TO THE NATIONS.' 1:6 THEN I SAID, 'ALAS, LORD GOD! BEHOLD, I DO NOT KNOW HOW TO SPEAK, BECAUSE I AM A YOUTH.' 1:7 BUT THE LORD SAID TO ME, 'DO NOT SAY, 'I AM A YOUTH,' BECAUSE EVERYWHERE I SEND YOU, YOU SHALL GO, AND ALL THAT I COMMAND YOU, YOU SHALL SPEAK. 1:8 'DO NOT BE AFRAID OF THEM, FOR I AM WITH YOU TO DELIVER YOU,' DECLARES THE LORD. 1:9 THEN THE LORD STRETCHED OUT HIS HAND AND TOUCHED MY MOUTH, AND THE LORD SAID TO ME, 'BEHOLD, I HAVE PUT MY WORDS IN YOUR MOUTH. 1:10 'SEE, I HAVE APPOINTED YOU THIS DAY OVER THE NATIONS AND OVER THE KINGDOMS, TO PLUCK UP AND TO BREAK DOWN, TO DESTROY AND TO OVERTHROW, TO BUILD AND TO PLANT.' (NASB)

The interesting verse is found in **Jeremiah 1:5** as the Lord God speaks not just about knowing Jeremiah before he was formed in the womb. The text states **ה בטרם אצורך [אצור]** and this is the portion of the verse that is most often quoted, **"before I formed you in the belly, I knew you."** The less often quoted portion of the verse is what follows, **ו בטרם תצא מרחם הקדשתיך נביא לגוים נתתיך** **"before you came out from the womb, I sanctified you as a prophet to the nations"** We notice how the Lord God speaks of sanctifying the life of Jeremiah to be a prophet. This word **הקדשתיך** is from the root **קדש** which means to make holy, to set apart for the service of God, and in this instance to be a prophet. This was the plan of the Great Designer, our Creator in Heaven. These things speak to how God is all knowing. He knows who we are, who we will be, what we want, and what are needs are. In fact, the Lord God Almighty also has a plan for our lives according to **Jeremiah 29:14**.

ספר ירמיה פרק כט

י' **כִּי אֲנִי יָדַעְתִּי אֶת-הַמְחַשְׁבֹת אֲשֶׁר אֲנִי חֹשֵׁב עֲלֵיכֶם נְאֻם-יְהוָה מִחֻשְׁבוֹת
שְׁלוֹם וְלֹא לְרָעָה לְתֵת לָכֶם אַחֲרֵית וְתִקְוָה: יב וְקִרְאתֶם אֹתִי וְהִלַּכְתֶּם וְהִתְפַּלְלֶתֶם
אֵלַי וְשָׁמַעְתִּי אֲלֵיכֶם: יג וּבִקְשַׁתֶּם אֹתִי וּמְצַאתֶם כִּי תִדְרָשְׁנִי בְּכָל-לְבַבְכֶם: יד
וּנְמַצְתִּי לָכֶם נְאֻם-יְהוָה וְשִׁבְתִּי אֶת-שְׁבִיתְכֶם [שְׁבוּתְכֶם] וְקִבְצְתִּי אֶתְכֶם מִכָּל-הַגּוֹיִם**

ומכל-המקומות אשר הדחתי אתכם שם נאם-יהוה והשבתי אתכם אל-המקום
אשר-הגלית אתכם משם

JEREMIAH 29:11-14

29:11 'FOR I KNOW THE PLANS THAT I HAVE FOR YOU,' DECLARES THE LORD, 'PLANS FOR WELFARE AND NOT FOR CALAMITY TO GIVE YOU A FUTURE AND A HOPE. 29:12 'THEN YOU WILL CALL UPON ME AND COME AND PRAY TO ME, AND I WILL LISTEN TO YOU. 29:13 'YOU WILL SEEK ME AND FIND ME WHEN YOU SEARCH FOR ME WITH ALL YOUR HEART. 29:14 'I WILL BE FOUND BY YOU,' DECLARES THE LORD, 'AND I WILL RESTORE YOUR FORTUNES AND WILL GATHER YOU FROM ALL THE NATIONS AND FROM ALL THE PLACES WHERE I HAVE DRIVEN YOU,' DECLARES THE LORD, 'AND I WILL BRING YOU BACK TO THE PLACE FROM WHERE I SENT YOU INTO EXILE.' (NASB)

Here the specific verse we are interested in is Jeremiah 29:11, which states, יא כי אנכי ידעתי, *"For I know the plans (את-המחשבת) that I have for you," declares the Lord (אנכי חשב עליכם נאם-יהוה), 'plans for welfare (שלום, peace) and not for calamity (ולא לרעה, and not evil) to give you a future (את-המחשבת) and a hope (ותקוה)."* We note how this parallels the scientific research from the sense of the designer having a plan and vision for the future of his creation. We see here in God's words to the people of Israel, these are not just words to Jeremiah, they are for a nation of people. So when we read these verses, the questions one might ask are, *"If God already has a plan for me, why should I pray?"* and *"If He already knows what I want, why should I tell Him?"* When we consider the verses that speak of God having a foreknowledge as knowing us before we were created, this suggests that God knows who we are and what we were capable of, and what we will become. The all knowing God also understands our circumstances and the events that are occurring in our lives. He knows what we want and what we need and as Jeremiah states, *"For I know the plans (את-המחשבת) that I have for you," declares the Lord (אנכי חשב עליכם נאם-יהוה), 'plans for welfare (שלום, peace) and not for calamity (ולא לרעה, and not evil) to give you a future (את-המחשבת) and a hope (ותקוה)."* These things teach us that God has a plan for our lives, and He knows best how to accomplish His plan for our lives. So, *"why should we pray with requests to God?"* This approach suggests that God has every detail worked out in our lives, exactly what we are going to do each day in our job, marriage, college, etc. Is this what the Scriptures really tell us about how the Lord functions in our lives? This is a very important question, and illustrates why studying Torah is so important for our lives today, especially for understanding these things and getting answers for these questions! By studying the Torah we learn something about God and His creation. We learn that God's plan for our lives is more *"fluid" or "dynamic"* than we realized. Note also understanding these things requires one to have read the Scriptures, and doing so year after year after year, all of our lives.

Let's get our answers from the Torah and so we begin in Bereshit / Genesis 12:1-3, ואימר א יהוה אל-אברהם לך-לך מארץ וממולדתך ומבית אביך אל-הארץ אשר אראך: ב ואעשרך לגוי גדול ואברכך ואגדלה שמך

12:1 : והיה ברכה: ג ואברכה מברכך ומקללך אאר ונברכו בך כל משפחת האדמה: *Now the Lord said to Abram, 'Go forth from your country, And from your relatives And from your father's house, To the land which I will show you; 12:2 And I will make you a great nation, And I will bless you, And make your name great; And so you shall be a blessing; 12:3 And I will bless those who bless you, And the one who curses you I will curse. And in you all the families of the earth will be blessed.' (NASB)* We are told that God promised Abraham that His descendants become a great nation. Note how this is the plan of God to do for Abraham! The Lord God also promised that this great nation would come through Isaac and Jacob. (*Bereshit / Genesis 28:13-15*) Then we read how the nation of Israel grew to great numbers while in servitude to Egypt. The Lord God delivered His people from Bondage, destroyed the Egyptian Army, and brought His people to the Mountain of Sinai. It is here we read how Moshe went up the mountain, and while he was upon the mountain, the people made for themselves a golden calf. (*Parashat Ki Tisa, Shemot / Exodus 32*) It was this particular point in time in which the Lord God informed Moshe of what He was about to do to Israel because of her sin.

ספר שמות פרק לב

י' ועתה הניחה לי ויחר-אפי בהם ואכלם ואעשה אותך לגוי גדול: יא ויחל משה את-פני יהוה אלהיו ויאמר למה יהוה יחרה אפך בעמך אשר הוצאת מארץ מצרים: בכם גדול וגיד וביד חזקה: יב למה יאמרו מצרים לאמר ברעה הוציאם להרג אתם בזהרים ולכלתם מעל פני האדמה שוב מחרון אפך והנחם על-הרעה לעמך:

SHEMOT / EXODUS 32:10-12

32:10 'NOW THEN LET ME ALONE, THAT MY ANGER MAY BURN AGAINST THEM AND THAT I MAY DESTROY THEM; AND I WILL MAKE OF YOU A GREAT NATION.' 32:11 THEN MOSES ENTREATED THE LORD HIS GOD, AND SAID, 'O LORD, WHY DOES YOUR ANGER BURN AGAINST YOUR PEOPLE WHOM YOU HAVE BROUGHT OUT FROM THE LAND OF EGYPT WITH GREAT POWER AND WITH A MIGHTY HAND? 32:12 'WHY SHOULD THE EGYPTIANS SPEAK, SAYING, 'WITH EVIL INTENT HE BROUGHT THEM OUT TO KILL THEM IN THE MOUNTAINS AND TO DESTROY THEM FROM THE FACE OF THE EARTH'? TURN FROM YOUR BURNING ANGER AND CHANGE YOUR MIND ABOUT DOING HARM TO YOUR PEOPLE. (NASB)

The idea here in the pages of the Torah speaks to how the Lord God was going to destroy Israel and start over with Moshe making him into a great nation. This seems contradictory to His plan that He had for the nation as having promised Abraham his descendants would be vast and numerous. The question is that if God had destroyed Israel and made Moshe into a great nation, would this contradict what God had promised to Abraham? No, since Moshe was also a descendant of Abraham and so making Him a great nation would NOT lead to a contradiction in terms. The point here is, God's plan remains, and yet we see how

Moshe was able to dissuade God from destroying the people. We note that in this case, God told Moshe directly what He was going to do to the people. In our own lives, we do not know exactly what God is going to do! Moshe prayed and persuaded God to not destroy Israel, and he did this through prayer! Notice how God's plan was in place, yet Moshe praying in supplication and intercession on behalf of Israel changed the path by which the plan proceeded. Destroying the nation due to her sins was God's plan, and then Moshe interceded to change the outcome of their sin. (Note, this is how Yeshua functions in our lives as our savior!) In these Scriptures, Moshe argues with God to not kill the people. ([Shemot / Exodus 32:10-13](#), וַעֲנֵשׂה אוֹתָךְ לְגוֹי גְדוֹל, וְעַתָּה הִנִּיחָה לִי וְיִחַר-אַפִּי בָהֶם וְאַכְלֵם וְאַעֲשֶׂה אוֹתָךְ לְגוֹי גְדוֹל) and the Lord God relents to what he had determined to do. The Torah is revealing to us why prayer and supplication (making requests) are so important!

We note other examples from the Torah, as God having knowledge of what was to happen, yet He asked where Adam and Eve were in [Bereshit / Genesis 3:9](#). Take another example on the Lord telling Abraham to sacrifice his only son Isaac ([Bereshit / Genesis 22](#)). The point of these narratives is to show us that prayer is not ineffectual when God knows all. We are not told, but can you imagine how Abraham was praying while making his trip to Mount Moriah to sacrifice his only son? The point of revealing these things to Moshe may have been for the Lord to understand how Moshe understood these things. In this situation, the Lord was seeing what Moshe thought and how he would respond to God's plan. Note how the Torah also reveals to us that God does not control our thoughts. He wants to hear our thoughts, wants, and desires. We notice how Moshe through his prayer did not change God's plan for the nation of Israel as He promised to Abraham. Either way God's plan would have been fulfilled! It was however through prayer and supplication that led to exactly how that plan God had was fulfilled! This is a significant thing the Scriptures are teaching us! It is in this way that as we pray, our thoughts, our feelings, our supplication, and our submission to God's Word, we are showing to whom we belong, taking our stand with the Lord by seeking His help. It is by our prayer requests that we find ourselves seeking God in heaven to help us to live our lives for His glory. The Torah reveals to us how the Lord God is looking for our interactive participation with His plan through prayer. These things reveal also how our relationship with God and His Messiah Yeshua is very important and yet very fluid / dynamic! David wrote almost half of the psalms and many of which were for the purpose of asking the Lord to meet his struggles and desires with hope, success, and salvation. This is how David is called a man after God's own heart. Our relationship with God is not a passive one, but an active one as we seek His will. So when we look at our own situation, we can know that God is going to carry out His will in our lives no matter what. Our prayers however shape and mold how God works out His plan, how the Lord works out the necessary steps to get there. This is what Paul meant when he said *"work out your salvation with fear and trembling"* according to [Philippians 2:12](#). When we do this, we also must be aware that the Lord God may have a different idea than we have in our mind's. We can live however with confidence, that no matter how our lives play out, the Lord will take care of us!

MATSATI

<https://www.matsati.com>

Dr. Duane D. Miller received his Ph.D., M.S., and B.S. Degree in Chemical Engineering from The University of Akron Ohio. He is currently a Chemical Engineering Researcher. Duane's research expertise has focused upon functional materials development for the control, conversion, and release of process gases in Energy production technologies. His R&D interests include computational chemistry, developing novel technologies for converting biomass to fuels and studying their fundamental interactions during the chemical conversion process. His past experience includes sorbent development for pre- and post-combustion CO₂ and SO₂ capture, selective absorption of H₂S from methane streams, O₂ capture for oxy-fuel combustion, photocatalytic reduction of alcohols, NO_x reduction catalysis, the development of oxygen carriers to combust fossil fuels (CH₄ and coal) for the chemical looping combustion processes, and the extraction of rare earth elements using patent pending sorbents. His research expertise has focused on operando-characterization using Infrared, Raman, and UV-Vis spectroscopy to observe the nature of the catalytic active sites and reaction intermediates under realistic reaction conditions, allowing direct correlation of molecular/electronic structures with catalyst performance during Gas-Solid / Liquid-Solid Adsorption and Photocatalytic Processes with real time online analysis of reaction products using ICP-MS and mass spectrometry. His current work involves a multi-disciplinary approach to developing, understanding, and improving the catalytic gasification of coal and methane, high temperature chemical looping combustion, and the catalytic decomposition and gasification of biomass and coal using novel microwave reactor. He has been studying the Hebrew Scriptures and the Torah for 20+ years and sharing what he has learned. The studies developed for MATSATI.COM are freely to be used by everyone, to God be the Glory!

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