

課程大綱與教學計劃書：大腦中的語言處理

科號		組別		學分	3	人數限制	暫不填寫
上課時間	星期四 a, b, c (18:30~21:20)			教室	暫不填寫		
科目中文名稱	大腦中的語言處理						
科目英文名稱	Language Processing in the Brain						
任課教師	呂菁菁						
擋修科目	無			擋修分數			
一、課程說明	<p>對於學習語言和使用語言來說，大腦絕對是最重要的器官。通過研究大腦，我們可以學到很多關於語言運作的知識。本課程著重於探討，在人類使用語言或是進行語言理解時，在頭腦中發生了什麼，以便我們能夠說出或理解語言？大腦的哪些部分可以做到這一些？這些部分如何協同工作？如果出現問題怎麼辦？</p> <p>本課程介紹與語言運作相關的大腦部位。課程主要目標是 (1) 將語言學、心理學和神經科學的基本概念結合在一起； (2) 向學生介紹語言與大腦相關的研究方法； (3) 介紹語言與大腦相關領域目前已累積的研究成果。本課程將從介紹性講座開始，討論語言學和認知神經科學的基本問題和方法，包括神經影像學技術與事件相關腦電位研究。接下來，我們將研究廣泛的主題，包括：(第一和第二) 語言習得、語音感知和概念表徵的神經基礎、失語症（獲得性語言障礙）、退化性疾病引起的失語症、以及語言認知控制的大腦基礎。每堂課都會有兩至三位學生主導的報告以及分別對一篇研究文章的討論和評論。</p>						
二、指定用書	<p>(1) Coursera 免費註冊課程 (課程影片中講師講授時螢幕同步出現繁體中文字幕) 此課程已有 165,246 位學生註冊過，課程評分平均 4.7 (2,007 位評分者) 講授者：Prof. Marc van Oostendorp，課程提供學校：Universiteit Leiden，適合學習對象：初學者 https://www.coursera.org/lecture/human-language/introduction-ukXvf?utm_source=link&utm_medium=page_share&utm_conte</p>						

	<p>nt=vlp&utm_campaign=top_button</p> <p>課名：Miracles of Human Language: An Introduction to Linguistics 人類語言的奇蹟：語言學導論</p> <p>線上課程影片為六個 Weeks 的課程內容，影片長度合計 23 小時</p> <p>(2)</p> <p>Coursera 免費註冊課程 (課程影片中講師講授時螢幕同步出現簡體中文字幕) 此課程已有 174,800 位學生註冊過，課程評分平均 4.9 (2,216 位評分者)</p> <p>講授者：Prof. Peggy Mason ，課程提供學校：The University of Chicago，適合學習對象：初學者</p> <p>https://www.coursera.org/lecture/neurobiology/introduction-the-bauby-story-nlmmmd?utm_source=link&utm_medium=page_share&utm_content=vlp&utm_campaign=top_button</p> <p>課名：Understanding the Brain: The Neurobiology of Everyday Life 了解大腦：日常生活的神經生物學</p> <p>線上課程影片為十個 Weeks 的課程內容，影片長度合計 28 小時</p>
三、參考書籍	<p>Rita Carter. (2019). <i>The Human Brain Book : An Illustrated Guide to Its Structure, Function, and Disorders: Vol. Third edition, revised new edition and updated.</i> DK. (清華大學圖書館有線上版)</p> <p>https://search-ebshost-com.nthulib-oc.nthu.edu.tw/login.aspx?direct=true&db=nlebk&AN=1964500&lang=zh-tw&site=ehost-live&ebv=EB&ppid=pp_CA</p>
四、教學方式	<p>(1)非同步線上課程學習、(2)課堂講授、(3)專題討論</p> <p>備註：因當代大腦的先進研究常以實體儀器或研究圖表呈現，因此本課程的同步上課週次為 16 週，另兩週的學習內容則請修課同學非同步研習 Coursera 中評價相當高的兩門相關課程：(1) Understanding the Brain: The Neurobiology of Everyday Life ，(2) Miracles of Human Language: An Introduction to Linguistics 。這兩個課程中，一個介紹大腦的基本概念，另一個介紹語言學的基本概念。請決定修課的同學，在開學第一週上課時繳交線上研讀這兩個免費課程的學習心得紙本，長度為 A4 size 紙張 3~10 頁。</p>

五、教學進度	<p>Week 1</p> <p>Arvanitakis, Z., Shah, R. C., & Bennett, D. A. (2019). Diagnosis and Management of Dementia: Review. <i>Jama-Journal of the American Medical Association</i>, 322(16), 1589-1599. doi:10.1001/jama.2019.4782</p> <p>Rogers, J. M., Donnelly, J., & Wilson, P. H. (2015). Source localization of an event-related potential marker of executive attention following mild traumatic brain injury. <i>Neuroreport</i>, 26(15), 903-907. doi:10.1097/wnr.0000000000000445</p>
	<p>Week 2</p> <p>Bejanin, A., Schonhaut, D. R., La Joie, R., Kramer, J. H., Baker, S. L., Sosa, N., . . . Rabinovici, G. D. (2017). Tau pathology and neurodegeneration contribute to cognitive impairment in Alzheimer's disease. <i>Brain</i>, 140, 3286-3300. doi:10.1093/brain/awx243</p> <p>Schweinberger, S. R., Pickering, E. C., Jentsch, I., Burton, A. M., & Kaufmann, J. M. (2002). Event-related brain potential evidence for a response of inferior temporal cortex to familiar face repetitions. <i>Cognitive Brain Research</i>, 14(3), 398-409. doi:10.1016/s0926-6410(02)00142-8</p>
	<p>Week 3</p> <p>Bang, J., Spina, S., & Miller, B. L. (2015). Frontotemporal dementia. <i>Lancet</i>, 386(10004), 1672-1682. doi:10.1016/s0140-6736(15)00461-4</p> <p>Shen, W. L., Fiori-Duharcourt, N., & Isel, F. (2016). Functional significance of the semantic P600: evidence from the event-related brain potential source localization. <i>Neuroreport</i>, 27(7), 548-558. doi:10.1097/wnr.0000000000000583</p>
	<p>Week 4</p> <p>Gorno-Tempini, M. L., Hillis, A. E., Weintraub, S., Kertesz, A., Mendez, M., Cappa, S. F., . . . Grossman, M. (2011). Classification of primary progressive aphasia and its variants. <i>Neurology</i>, 76(11), 1006-1014. doi:10.1212/WNL.0b013e31821103e6</p> <p>Shinoda, J., Nakagome, K., Mimura, M., & Homma, I. (2004). Source localization of event-related potentials related to cross-modal semantic interference effect using scalp-skull-brain dipole tracing method. Paper presented at the 1st International Symposium for Life Sciences, Showa Univ, Tokyo, JAPAN.</p>
	<p>Week 5</p>

	<p>Catani, M., Mesulam, M. M., Jakobsen, E., Malik, F., Martersteck, A., Wieneke, C., . . . Rogalski, E. (2013). A novel frontal pathway underlies verbal fluency in primary progressive aphasia. <i>Brain</i>, 136, 2619-2628. doi:10.1093/brain/awt163</p> <p>Tokimoto, S., Miyaoka, Y., & Tokimoto, N. (2021). An EEG Analysis of Honorification(in Japanese: Human Hierarchical Relationships Coded in Language. <i>Frontiers in Psychology</i>, 12. doi:10.3389/fpsyg.2021.549839</p> <p>Week 6</p> <p>Hamelin, L., Lagarde, J., Dorothee, G., Leroy, C., Labit, M., Comley, R. A., . . . Clinical, I. T. (2016). Early and protective microglial activation in Alzheimer's disease: a prospective study using F-18-DPA-714 PET imaging. <i>Brain</i>, 139, 1252-1264. doi:10.1093/brain/aww017</p> <p>Ortiz-Mantilla, S., Hamalainen, J. A., & Benasich, A. A. (2012). Time course of ERP generators to syllables in infants: A source localization study using age-appropriate brain templates. <i>Neuroimage</i>, 59(4), 3275-3287. doi:10.1016/j.neuroimage.2011.11.048</p> <p>Week 7</p> <p>Sachdev, P. S., Blacker, D., Blazer, D. G., Ganguli, M., Jeste, D. V., Paulsen, J. S., & Petersen, R. C. (2014). Classifying neurocognitive disorders: the DSM-5 approach. <i>Nature Reviews Neurology</i>, 10(11), 634-642. doi:10.1038/nrneurol.2014.181</p> <p>Hyde, M. (1997). The N1 response and its applications. <i>Audiology and Neuro-Otology</i>, 2(5), 281-307. doi:10.1159/000259253</p> <p>Week 8</p> <p>Iannilli, E., Sorokowska, A., Zhigang, Z., Hahner, A., Warr, J., & Hummel, T. (2015). Source localization of event-related brain activity elicited by food and nonfood odors. <i>Neuroscience</i>, 289, 99-105. doi:10.1016/j.neuroscience.2014.12.044</p> <p>Pires, L., Leitao, J., Guerrini, C., & Simoes, M. R. (2014). Event-Related Brain Potentials in the Study of Inhibition: Cognitive Control, Source Localization and Age-Related Modulations. <i>Neuropsychology Review</i>, 24(4), 461-490. doi:10.1007/s11065-014-9275-4</p> <p>Kim, K. H., Yoon, H. W., Park, H. W., & Ieee. (2005, Mar 16-20). Event-related potential study of brain activation during word/pictogram perception by native Korean speakers. Paper presented at the 2nd International IEEE/EMBS Conference on Neural Engineering, Arlington, VA.</p>
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	<p>Week 9</p> <p>Parra, M. A., Baez, S., Sedeno, L., Campo, C. G., Santamaria-Garcia, H., Aprahamian, I., . . . Ibanez, A. (2021). Dementia in Latin America: Paving the way toward a regional action plan. <i>Alzheimers & Dementia</i>, 17(2), 295-313. doi:10.1002/alz.12202</p> <p>Dien, J., Spencer, K. M., & Donchin, E. (2003). Localization of the event-related potential novelty response as defined by principal components analysis. <i>Cognitive Brain Research</i>, 17(3), 637-650. doi:10.1016/s0926-6410(03)00188-5</p> <p>Week 10</p> <p>Antoniou, M. (2019). The Advantages of Bilingualism Debate. In M. Liberman & B. H. Partee (Eds.), <i>Annual Review of Linguistics</i>, Vol 5 (Vol. 5, pp. 395-415).</p> <p>Foti, D., Weinberg, A., Dien, J., & Hajcak, G. (2011). Event-related potential activity in the basal ganglia differentiates rewards from nonrewards: Temporospacial principal components analysis and source localization of the feedback negativity. <i>Human Brain Mapping</i>, 32(12), 2207-2216. doi:10.1002/hbm.21182</p> <p>Week 11</p> <p>Bialystok, E., Craik, F. I. M., & Luk, G. (2012). Bilingualism: consequences for mind and brain. <i>Trends in Cognitive Sciences</i>, 16(4), 240-250. doi:10.1016/j.tics.2012.03.001</p> <p>Frishkoff, G. A. (2007). Hemispheric differences in strong versus weak semantic priming: Evidence from event-related brain potentials. <i>Brain and Language</i>, 100(1), 23-43. doi:10.1016/j.bandl.2006.06.117</p> <p>Week 12</p> <p>Valian, V. (2015). Bilingualism and cognition. <i>Bilingualism-Language and Cognition</i>, 18(1), 3-24. doi:10.1017/s1366728914000522</p> <p>Heldmann, M., Puppe, S., Effenberg, A. O., & Munte, T. F. (2017). Development of sensitivity to orthographic errors in children: an event-related potential study. <i>Neuroscience</i>, 358, 349-360. doi:10.1016/j.neuroscience.2017.07.002</p> <p>Week 13</p> <p>Loprinzi, P. D., Frith, E., Edwards, M. K., Sng, E., & Ashpole, N. (2018). The effects of exercise on memory function among young to middle-aged adults: Systematic review and recommendations for future research. <i>American Journal of Health Promotion</i>, 32(3), 691-704.</p>
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	<p>doi:10.1177/0890117117737409 Lascano, A. M., Hummel, T., Lacroix, J. S., Landis, B. N., & Michel, C. M. (2010). Spatio-temporal dynamics of olfactory processing in the human brain: an event-related source imaging study. <i>Neuroscience</i>, 167(3), 700-708. doi:10.1016/j.neuroscience.2010.02.013</p> <p>Week 14 Brain Network Functional Connectivity in Alzheimer’s Disease and Frontotemporal Dementia, by Zhou, Juan Helen ; Ng, Kwun Kei ; Liu, Siwei. In <i>fMRI</i>, 2020-05-12, p.385-415. Litvak, V., Mattout, J., Kiebel, S., Phillips, C., Henson, R., Kilner, J., . . . Friston, K. (2011). EEG and MEG Data Analysis in SPM8. <i>Computational Intelligence and Neuroscience</i>, 2011. doi:10.1155/2011/852961</p> <p>Week 15 Single Photon Emission Computed Tomography (SPECT) in Dementias, by Wu, Dafang, in <i>Clinical Nuclear Medicine Neuroimaging</i>, 2020-04-25, p.63-99. Terrasa, J. L., Montoya, P., Gonzalez-Roldan, A. M., & Sitges, C. (2018). Inhibitory control impairment on somatosensory gating due to aging: An event-related potential study. <i>Frontiers in Human Neuroscience</i>, 12. doi:10.3389/fnhum.2018.00280</p> <p>Week 16 Dudschigt, C., Mackenzie, I. G., Strozyk, J., Kaup, B., & Leuthold, H. (2016). The sounds of sentences: Differentiating the influence of physical sound, sound imagery, and linguistically implied sounds on physical sound processing. <i>Cognitive Affective & Behavioral Neuroscience</i>, 16(5), 940-961. doi:10.3758/s13415-016-0444-1 Kashyap, R., Ouyang, G., Sommer, W., & Zhou, C. S. (2016). Neuroanatomic localization of priming effects for famous faces with latency-corrected event-related potentials. <i>Brain Research</i>, 1632, 58-72. doi:10.1016/j.brainres.2015.12.001 Meyer, L., Obleser, J., Kiebel, S. J., & Friederici, A. D. (2012). Spatiotemporal dynamics of argument retrieval and reordering: an fMRI and EEG study on sentence processing. <i>Frontiers in Psychology</i>, 3. doi:10.3389/fpsyg.2012.00523</p>
六、成績考核	(1) Coursera 免費線上課程學習心得：40% (兩個課程：Understanding the Brain: The Neurobiology of Everyday Life & Miracles of Human Language: An Introduction to Linguistics)

	<p>(2) 主導的演講以及分別對一篇研究文章的討論和評論：40% (每位碩班同學一學期分配到兩次)</p> <p>(3) 期末報告：語言與大腦研究文獻的表格整理：20% (長度為 A4 size 紙張 3~10 頁)</p>
<p>七、講義位址 http://</p>	<p>(1) https://www.coursera.org/lecture/human-language/introduction-ukXvf?utm_source=link&utm_medium=page_share&utm_content=vlp&utm_campaign=top_button</p> <p>(2) https://www.coursera.org/lecture/neurobiology/introduction-the-bauby-story-nlmmmd?utm_source=link&utm_medium=page_share&utm_content=vlp&utm_campaign=top_button</p>