

Curriculum Vitae
Anatoly Abraham Gitelson, Ph.D.
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EDUCATION AND TRAINING:

Ph.D. - The Institute of Radio Technology, Taganrog, USSR 1972

M.S. - The Institute of Radio Technology, Taganrog, USSR 1964

PROFESSIONAL EXPERIENCE:

2014-date *Visiting professor*, Israel Institute of Technology (Technion).

2014-2016 *Marie Curie International Incoming Visiting Professor*, Israel Institute of Technology (Technion).

2014-date *Professor Emeritus*, School of Natural Resources, University of Nebraska-Lincoln.

2000-2014 *Professor*, School of Natural Resources, University of Nebraska-Lincoln.

1997-2000 *Head*, Department for Environmental Physics and Energy Research, J. Blaustein Institute for Desert Research, Ben-Gurion University of the Negev.

1992-2000 *Professor*, Department of Geological and Environmental Sciences, Ben-Gurion University of the Negev.

1990-2000 *Senior scientist*, Remote Sensing Laboratory, J. Blaustein Institute for Desert Research, Ben-Gurion University of the Negev.

1981-1989 *Head*, Remote Sensing Lab, Hydrochemical Institute, Environmental Protection Agency, Rostov-on-Don, USSR.

1977-1981 *Senior scientist*, Institute for Nuclear Research, Academy of Sciences, USSR, Moscow, USSR.

1973-1977 *Senior scientist, head*, Laboratory for Solid State Electronics, Physical Institute, Rostov-on-Don State University, USSR.

1964-1972 *Scientist*, Institute for Microwave Electronics, Krasnodar, USSR.

RESEARCH INTERESTS:

Radiative transfer in vegetation, water and atmosphere, remote sensing of terrestrial and aquatic environment.

TEACHING ACTIVITY:

Introduction to remote sensing, Remote sensing of environment, Quantitative remote sensing, among others.

AWARDS, HONORS, RESEARCH FELLOWSHIPS

1977 USSR Academy of Sciences - best work of the year in Solid State Physics: Physical properties of thin ferroelectric films. *Solid State Physics*, 1977- Vol. 19, No. 6, pp. 1556-1560; Vol. 19, No. 7, pp.1913-1919.

1981 USSR Academy of Sciences - best work of the year in Physics of High Energy Particles: Lower limit on the proton lifetime according to data from the Baksan underground telescope. *American Inst. of Physics*, 0021-0/81/120651-3.

1996 DAAD, German Academy of Sciences Fellowship, University of Karlsruhe.

1998 Israeli State Award "For Outstanding Contribution to Israeli Science", to 50th Israel Anniversary, Israeli Ministry of Science and Technology, Israeli Ministry of Absorption.

2014 Marie Curie Incoming International Fellowship, European Commission.

MENTORED GRADUATE STUDENTS

Major Professor & Dissertation Advisor: 23 Ph.D. and 20 M.S. completed.

Recently completed dissertations at UNL:

- Tarlan Razzaghi, Ph.D., 2016. Quantifying variability of surface reflectance and estimating canopy chlorophyll content and green biomass using hyperspectral close range data and airborne

imagery.

- Anthony Lawrence Nguy-Robertson, Ph.D., 2013. Remote Sensing of green Leaf Area Index in Maize and Soybean: From Close Range to Satellites.
- Daniela Gurlin, Ph.D., 2012. Remote estimation of phytoplankton chlorophyll-a in inland, estuarine and coastal waters.
- Yi Peng, Ph.D., 2012. Estimation of gross primary production in crops: from close range to satellites.
- Arthur I. Zygielbaum, Ph.D., 2009. Detection and Measurement of Water Stress in Vegetation Using Visible Spectrum Reflectance
- Wesley J. Moses, Ph.D., 2009. Satellite-Based Estimation of Chlorophyll-a Concentration in Turbid Productive Waters.
- Giorgio Dall’Olmo, Ph.D., 2006. Isolation of Optical Signatures of Phytoplankton Pigments in Turbid Productive Waters: Remote Assessment of Chlorophyll-a.
- Veronica Ciganda, Ph. D., 2006. Distribution of Chlorophyll in Maize Canopy: Technique, Quantification, and Implications for Remote Sensing
- Andres Vina, Ph.D., 2004. Remote Estimation of Leaf Area Index and Biomass in Crops.

RESEARCH GRANTS (PAST FIVE YEARS):

- 2014-2016, MARIE CURIE ACTIONS, Incoming International Fellowships, European Commission, Remote Estimating Vegetation Health, 300,000 EUR.

PROFESSIONAL SERVICE

- Editorial board member, Remote Sensing of Environment
- Editorial board member, International Journal of Applied Remote Sensing

PUBLICATIONS (since 1990) <http://calmit.unl.edu/people/agitelson2>

Gilberto Pastorello et al. 2020. The FLUXNET2015 dataset and the ONEFlux processing pipeline for eddy covariance data. *Scientific Data*, 7: 225, <https://doi.org/10.1038/s41597-020-0534-3>

Peng, Y., Kira, O., Nguy-Robertson, A., Suyker, A., Arkebauer, T., Sun, Y., and Gitelson, A.A. 2019. Gross Primary Production Estimation in Crops Using Solely Remotely Sensed Data, *Agron. J.* 111, 1–10, <https://doi:10.2134/agronj2019.05.0332>

Gitelson, A., Viña, A., Solovchenko, A., Arkebauer, T., Inoue, Y. 2019. Derivation of canopy light absorption coefficient from reflectance spectra, *Remote Sensing of Environment*, 231, 111236, <https://doi.org/10.1016/j.rse.2019.111276>

Moses, W.J, Saprygin, V., Gerasyuk, V., Povazhnyy, V., Sergey Berdnikov, S., and Gitelson, A.A. 2019. OLCI-Based NIR-red Models for Estimating Chlorophyll-a Concentration in Productive Coastal Waters – A Preliminary Evaluation, *Environmental Research Communications*, 1, 011002, <https://doi.org/10.1088/2515-7620/aaf53c>

Gitelson, A.A., 2019. Remote estimation of fraction of radiation absorbed by photosynthetically active vegetation: generic algorithm for maize and soybean, *Remote Sensing Letters*, 10, 283-291, <https://doi.org/10.1080/2150704X.2018.1547445>

Gitelson, A.A., Arkebauer, T.J., Suyker, A.E., 2018. Convergence of daily light use efficiency in irrigated and rainfed C3 and C4 crops, *Remote Sensing of Environment*, 217, 30-37, <https://doi.org/10.1016/j.rse.2018.08.007>

Hank, T.B., Berger, K., Bach, H., Clevers, J.G.P.W., Gitelson, A., Zarco-Tejada, P., and Mauser, W. 2018. Spaceborne Imaging Spectroscopy for Sustainable Agriculture: Contributions and Challenges, *Surveys in Geophysics*, <https://doi.org/10.1007/s10712-018-9492-0>

Gitelson, A.A., and A. Solovchenko. 2018. Non-invasive Quantification of Foliar Pigments: Principles and Implementation. *Hyperspectral Remote Sensing of Vegetation*, Second Edition, (Thenkabail, P.S., Lyon, J.G., Huete, A., Eds), Chapter 5, Vol. II, pp. 135-162. CRC Press- Taylor

- and Francis group, Boca Raton, London, New York.
- Gitelson, A.A., 2018. Recent Developments in Remote Estimation of Crop Biophysical and Biochemical Properties at Various Scales, *Hyperspectral Remote Sensing of Vegetation*, (Thenkabail, P.S., Lyon, J.G., Huete, A., Eds), Chapter 1, Vol. III, pp. 3-24. CRC Press- Taylor and Francis group, Boca Raton, London, New York.
- Gitelson, A., A. Solovchenko. 2018. Non-invasive quantification of foliar pigments: Possibilities and limitations of reflectance- and absorbance-based approaches, *Journal of Photochemistry and Photobiology B: Biology*, Vol. 178: 537-544 <https://doi.org/10.1016/j.jphotobiol.2017.11.023>
- Gitelson, A., & Solovchenko, A. 2017. Generic algorithms for estimating foliar pigment content. *Geophysical Research Letters*, 44. <https://doi.org/10.1002/2017GL074799>
- Kira, O, Nguy-Robertson, A L., Arkebauer, T. J., Linker, R., and Gitelson, A.A. (2017). Toward Generic Models for Green LAI Estimation in Maize and Soybean: Satellite Observations, *Remote Sensing*, 9, 318; doi:10.3390/rs9040318
- Féret, J.-B., Gitelson, A.A., Noble, S.D., S. Jacquemoud, S. (2017). PROSPECT-D: towards modeling leaf optical properties through a complete lifecycle, *Remote Sensing of Environment*, 193, 204–215, <http://dx.doi.org/10.1016/j.rse.2017.03.004>
- Peng, Y., Nguy-Robertson, A., Arkebauer, T., Gitelson, A.A. (2017). Assessment of Canopy Chlorophyll Content Retrieval in Maize and Soybean: Implications of Hysteresis on the Development of Generic Algorithms, *Remote Sens.* 9, 226; doi:10.3390/rs9030226.
- Gitelson, A.A., Gamon. J.A., Solovchenko. A. (2017). Multiple drivers of seasonal change in PRI: Implications for photosynthesis 1. Leaf level, *Remote Sensing of Environment* 191, 110–116, <http://dx.doi.org/10.1016/j.rse.2016.12.014>
- Gitelson, A.A., Gamon. J.A., Solovchenko. A. (2017). Multiple drivers of seasonal change in PRI: Implications for photosynthesis 2. Stand level, *Remote Sensing of Environment* 190, 198–206, <http://dx.doi.org/10.1016/j.rse.2016.12.015>
- Gitelson, A., Chivkunova, O., Zhigalova, T., Solovchenko, A. (2017). In situ optical properties of foliar flavonoids: implication for non-destructive estimation of flavonoid content, *Journal of Plant Physiology* 218, 258–264. <https://authors.elsevier.com/a/1Viu2e3VObJGE>
- Bio-optical Modeling and Remote Sensing of Inland Waters, (2017). Edited by Mishra, D. R. Ogashawara, I., and Gitelson, A.A., Elsevier Inc. https://books.google.com/books?id=jgNQCwAAQBAJ&printsec=frontcover&hl=pt-BR&source=gbs_ge_summary_r&cad=0#v=onepage&q&f=false
- Ogashawara, I., Mishra, D. R. and Gitelson, A.A., *Remote Sensing of Inland Waters: Background and Current State-of-the-Art.* (2017). *Bio-optical Modeling and Remote Sensing of Inland Waters*, (2017). Edited by Mishra, D. R. Ogashawara, I., and Gitelson, A.A., Chapter 1, pp. 1-24, Elsevier Inc. https://books.google.com/books?id=jgNQCwAAQBAJ&printsec=frontcover&hl=pt-BR&source=gbs_ge_summary_r&cad=0#v=onepage&q&f=false
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- Inoue, Y., Guerif, M, Baret, F., Skidmore, A., Gitelson, A., Schlerf, M., Oliso, A. (2016). Simple and robust methods for remote sensing of canopy chlorophyll content: a comparative analysis of hyperspectral data for different types of vegetation, *Plant, Cell and Environment*, 39, 2609-2623 DOI: 10.1111/pce.12815.
- Verrelst, J., Rivera, J.P., Gitelson, A., Delegido, J., Moreno, J., Camps-Valls, G. (2016). Spectral

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- Gitelson, A. A., Peng, Y., Vina, A., Arkebauer, T., Schepers, J. S. (2016). Efficiency of chlorophyll in gross primary productivity: A proof of concept and application in crops. *Journal of Plant Physiology*, 201, 101–110, <http://dx.doi.org/10.1016/j.jplph.2016.05.019>
- Kira, O., A. L. Nguy-Robertson, T. J. Arkebauer, R. Linker, A. A. Gitelson. (2016). Informative spectral bands for remote green LAI estimation in C3 and C4 crops, *Agricultural and Forest Meteorology*, 218-219, 243-249, <http://dx.doi.org/10.1016/j.agrformet.2015.12.064>
- Ghosh, S., D. R. Mishra, A. A. Gitelson. (2016). Long-term monitoring of biophysical characteristics of tidal wetlands in the northern Gulf of Mexico — A methodological approach using MODIS, *Remote Sensing of Environment*, 173, 39–58, doi:10.1016/j.rse.2015.11.015
- Nguy-Robertson, A., Y. Peng, T. Arkebauer, D. Scoby, J. Schepers & A. Gitelson. (2015). Using a Simple Leaf Color Chart to Estimate Leaf and Canopy Chlorophyll a Content in Maize (*Zea mays*), *Communications in Soil Science and Plant Analysis*, <http://dx.doi.org/10.1080/00103624.2015.1093639>
- Houborg, R., M. McCabe, A. Cescatti, and A. Gitelson. (2015). Leaf chlorophyll constraint on model simulated Gross Primary Productivity in agricultural systems, *Int. J. Appl. Earth Observ. Geoinf.* 43, 160-176, <http://dx.doi.org/10.1016/j.jag.2015.03.016>
- Nguy-Robertson, A.L., A.A. Gitelson. (2015). Algorithms for estimating green leaf area index in C3 and C4 crops for MODIS, Landsat TM/ETM+, MERIS, Sentinel MSI/OLCI, and Venüs sensors *Remote Sensing Letters*, 6(5), 360-369, <http://dx.doi.org/10.1080/2150704X.2015.1034888>
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- Gitelson, A. A., Y. Peng, D.C. Rundquist, A. Suyker, S.B. Verma. (2015). Remote estimation of gross primary productivity in maize and soybean: from close range to satellites, *Precision Agriculture'15*, (J. V. Stafford Ed.), Wageningen Academic Publishers, The Netherlands, pp. 183-190, 2015, http://dx.doi.org/10.3920/978-90-8686-814-8_22.
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- Kira, O., R. Linker, A. Gitelson. (2015). Non-destructive estimation of foliar chlorophyll and carotenoid contents: Focus on informative spectral bands, *International Journal of Applied Earth Observation and Geoinformation*, 38, 251–260, <http://dx.doi.org/10.1016/j.jag.2015.01.003>
- Houborg, R., M. McCabe, A., Cescatti, F. Gao, M. Schull, A. Gitelson. (2015). Joint leaf chlorophyll content and leaf area index retrieval from Landsat data using a regularized model inversion system (REGFLEC), *Remote Sensing of Environment*, 159, 203–221, <http://dx.doi.org/10.1016/j.rse.2014.12.008>
- Fassnacht, F. E., S. Stenzel, A. A. Gitelson (2015). Non-destructive estimation of foliar carotenoid content of tree species using merged vegetation indices, *Journal of Plant Physiology*, 176, 210–217, <http://dx.doi.org/10.1016/j.jplph.2014.11.003>
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- Sakamoto, T., A. A. Gitelson, T. J. Arkebauer, (2014). Near real-time prediction of U.S. corn yields based on time-series MODIS data, *Remote Sensing of Environment*, 147, 219–231.
- Nguy-Robertson, A. L., Y. Peng, A. A. Gitelson, T. J. Arkebauer, A. Pimstein, I. Herrmann, A. Karnieli, D. C. Rundquist, D. J. Bonfil. (2014). Estimating green LAI in four crops: Potential of determining optimal spectral bands for a universal algorithm, *Agricultural and Forest Meteorology*, 192-193: 140-148.
- Gitelson, A. A., Y. Peng, K. F. Huemmrich. (2014). Relationship between fraction of radiation absorbed by photosynthesizing maize and soybean canopies and NDVI from remotely sensed data taken at close range and from MODIS 250 m resolution data, *Remote Sensing of Environment*, 147, 108–120; <https://doi.org/10.1016/j.rse.2014.02.014>.
- Rundquist, D. C., A. A. Gitelson, B. Leavitt, A. Zygielbaum, R. Perk, G. P., Keydan. (2014). Elements of an Integrated Phenotyping System for Monitoring Crop Status at Canopy Level, *Agronomy*, 4(1), 108-123; doi:10.3390/agronomy4010108.
- Gitelson, A. A., Y. Peng, T. J. Arkebauer, J. Schepers. (2014). Relationships between gross primary production, green LAI, and canopy chlorophyll content in maize: Implications for remote sensing of primary production, *Remote Sensing of Environment* 144, 65–72.
- Moses, W.J., A.A. Gitelson, S. Berdnikov, J. H. Bowles, V. Povazhnyi, V. Saprygin, E. J. Wagner, and K. W. Patterson. (2014). HICO-Based NIR-red Models for Estimating Chlorophyll-a Concentration in Productive Coastal Waters, *IEEE Geoscience and Remote Sensing Letters*. 11(6), 1111-1115. DOI 10.1109/LGRS.2013.2287458.
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- Houborg, R., Cescatti, A., and A.A. Gitelson. (2013). Integrating satellite retrieved leaf chlorophyll into land surface models for constraining simulations of water and carbon fluxes, *Geoscience and Remote Sensing Symposium (IGARSS)*, 21-26 July 2013, Melbourne, VIC, pp. 2129 – 2132, DOI: 10.1109/IGARSS.2013.6723234
- Nguy-Robertson, A., Gitelson, A.A., Peng, Y., Walter-Shea, E., Leavitt, B., and T. Arkebauer. (2013). Continuous Monitoring of Crop Reflectance, Vegetation Fraction, and Identification of Developmental Stages Using a Four Band Radiometer, *Agronomy Journal*, 105: 1769–1779.
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- Gitelson, A.A. 2013. Remote estimation of crop fractional vegetation cover: the use of noise equivalent as an indicator of performance of vegetation indices, *International Journal of Remote Sensing*, 1-13, DOI: 10.1080/01431161.2013.793868.
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- Clevers, J.G.P.W., Gitelson, A.A., 2013. Remote estimation of crop and grass chlorophyll and nitrogen content using red-edge bands on Sentinel-2 and -3, *International Journal of Applied Earth*

- Observation and Geoinformation, 23, 344-351.
- Guindin-Garcia, N., A.A. Gitelson, T. J. Arkebauer, J. Shanahan, A. Weiss. 2012. An Evaluation of MODIS 8 and 16 day composite products for monitoring maize green leaf area index, *Agricultural and Forest Meteorology*, 161: 15-25.
- Ciganda, V. S., A. A. Gitelson, J. Scheper. 2012. How deep does a remote sensor sense? Expression of chlorophyll content in a maize canopy, *Remote Sensing of Environment*, 126, 240-247.
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- Sakamoto, T., Gitelson, A.A., Wardlow, B.D., Arkebauer, T.J., Verma, S.B., and Suyker, A.E., M. Shibayama. 2012. Application of day and night digital photographs for estimating maize biophysical characteristics, *Precision Agriculture*, 13: 285–301 <https://doi.org/10.1007/s11119-011-9246-1>
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