Univ.Prof. Dipl.-Ing. Dr.techn. Werner Lienhart
Steyrergasse 30, A-8010 Graz, Austria werner.lienhart@tugraz.at

Curriculum Vitae

I. Personal Details

Title:	Univ.Prof. Dipl.-Ing. Dr.techn.
Name:	Werner Lienhart
Nationality:	Austria

II. Education

2001-2006	**PhD in Engineering Geodesy** Graz University of Technology, Austria Thesis Title: Analysis of Inhomogeneous Structural Monitoring Data Degree with *First Class Honours*
1998-2001 1994-1997	**Master in Geodesy** Graz University of Technology, Austria Thesis Title: Applications of Lumped Coefficients Approach for Selected Problems in Satellite Gravity Gradiometry Degree with *First Class Honours*
1997-1998	**BEng (Hons) in Engineering Surveying** (Final Year) Nottingham Trent University, United Kingdom Student Exchange within ERASMUS Program Thesis Title: Determination of the Local Horizon with Digital Image Processing Degree with *First Class Honours*

III. Work Experience

Since 01.10.2011	**University Professor and Head of the Institute** of Engineering Geodesy and Measurement Systems, Graz University of Technology, Austria
01.01.-31.08.2011	**Product Manager Innovation**, TPS Program, Business Area Geomatics, Leica Geosystems AG, Heerbrugg, Switzerland
2009-2010	**Senior Application Engineer**, Business Area Geomatics, Leica Geosystems AG, Heerbrugg, Switzerland
2006-2009	**Application Engineer**, Business Area Geomatics, Leica Geosystems AG, Heerbrugg, Switzerland
2001-2006	**University Assistant**, Graz University of Technology, Institute of Engineering Geodesy and Measurement Systems (Prof. Fritz K. Brunner), Austria
2000-2001	**Research Assistant**, Graz University of Technology, Institute of Engineering Geodesy and Measurement Systems (Prof. Fritz K. Brunner), Austria
1999-2000	**Project Staff Member**, Austrian Academy of Sciences, Space Research Institute (Prof. H. Sünkel)

IV. Patents

[PA8] **Lienhart W**, Monsberger C, Friessnig M (2018) *Apparatus and Method for Additive Manufacturing*, EP3511155 (A1): 16 pages

[PA7] **Lienhart W**, Galler R (2014) *Tübbingelement mit Dehnungsmessung*, AT516158 (B1): 53 pages

[PA6] **Lienhart W** (2011) *Measuring device and method for filtered presentation of object information*, EP2570768 (A1): 20 pages

[PA5] Metzler B, Sieber S, **Lienhart W**, Zogg H-M (2011) *Measuring Device that can be operated without Contact and Control Method for such a Measuring Device*, WO2013014084 (A1): 51 pages

[PA4] **Lienhart W**, Nindl D, Kotzur N (2011) *Robotic Surveying Instrument and Method for the Automated Autocollimation of a Telescope of a Surveying Instrument Comprising an Autocollimation Target*, WO2012072811 (A1): 63 pages

[PA3] Zogg H-M, **Lienhart W**, Nindl D, Kotzur N (2010) *Geodetic Survey System having a Camera integrated in a Remote Control Unit*, WO2012034813 (A1): 65 pages

[PA2] Nindl D, Zogg H-M, **Lienhart W**, Kotzur N (2010) *Target Point Recognition Method and Surveying Instrument*, EP2405237 (A1): 11 pages

[PA1] **Lienhart W**, Nindl D, Zogg H-M. Kotzur N (2010) *Surveying Instrument*, WO2011141547 (A1): 27 pages

V. Publications

[P127] Kalenjuk S, **Lienhart W**, Rebhan M (2021) *Processing of mobile laser scanning data for large-scale deformation monitoring of anchored retaining structures along highways.* Comput Aided Civ Inf. 2021: 1-17: https://doi.org/10.1111/mice.12656

[P126] Vorwagner A, Kwapisz M, **Lienhart W**, Winkler M, Grunicke U H (2021) *Rissweitenmessung mittels nachträglich angebrachten, verteilten faseroptischen Messsystemen.* Proc. 11. Symposium experimentelle Untersuchungen von Baukonstruktionen, Schriftenreihe Konstruktiver Ingenieurbau Dresden, Heft 55: 78-86

[P125] Bauer P, **Lienhart W**, Jost S (2021) *Accuracy Investigation of the Pose Determination of a VR System.* Sensors 2021, 21(5), 1622: https://doi.org/10.3390/s21051622

[P124] Monsberger C, **Lienhart W** (2021) *Distributed fiber optic shape sensing along shotcrete tunnel linings: Methodology, field applications, and monitoring results*. Journal of Civil Structural Health Monitoring (2021) 11: 337–350: https://doi.org/10.1007/s13349-020-00455-8

[P123] Bauer P, **Lienhart W** (2021) *VR-gestützte Planung von geodätischen Netzmessungen*, Proc. 21. Internationale Geodätische Woche Obergurgl 2021: 1–12

[P122] Bauer P, **Lienhart W**, Jost S (2021) *Genauigkeitsuntersuchung eines VR-Systems zur 3D-Koordinatenbestimmungccuracy.* AVN, 128 (2021) 1: 3-12

[P121] Moritz B, Heissenberger R, Schachinger T, **Lienhart W** (2021) *Long-term monitoring of railway tunnels.* Geomechanics and Tunnelling; 14 (2021): 35–46: https://doi.org/10.1002/geot.202000049

[P120] Grunicke U H, **Lienhart W**, Vorwagner A (2021) *Long-term monitoring of visually not inspectable tunnel linings.* Geomechanics and Tunnelling; 14 (2021): 19–32: https://doi.org/10.1002/geot.202000051

[P119] Buchmayer F, Monsberger CM, **Lienhart W** (2021) *Advantages of tunnel monitoring using distributed fibre optic sensing.* J. Appl. Geodesy 2021; 15(1): 1–12: https://doi.org/10.1515/jag-2019-0065

[P118] **Lienhart W**, Buchmayer F, Klug F, Monsberger CM (2020) *Distributed fibre-optic sensing applications at the Semmering Base Tunnel, Austria.* Proceedings of the Institution of Civil Engineers: https://doi.org/10.1680/jsmic.20.00006

[P117] Roberts GW, Hancock CM, **Lienhart W**, Klug F, Zuzek N, de Ligt H (2020) *Displacement and frequency response measurements of a ship using GPS and fibre optic-based sensors*. Applied Geomatics: https://doi.org/10.1007/s12518-020-00338-z

[P116] Monsberger C, **Lienhart W**, Hayden, M (2020) *Distributed fiber optic sensing along driven ductile piles: Design, sensor installation and monitoring benefits*. Journal of Civil Structural Health Monitoring (2020) 10: 627–637: https://doi.org/10.1007/s13349-020-00406-3

[P115] Vorwagner A, Kwapisz M, Prammer D, **Lienhart W**, Monsberger C, Winkler M, Grunicke U (2020) *Neue Möglichkeiten zur Rissweitenbestimmung an bestehenden Betonkonstruktionen mittels verteilter optischer Fasermessungen.* Proc.: 4. Brückenkolloquium, Technische Akademie Esslingen, Germany: 323-329

[P114] Bauer P, Jost S, **Lienhart W** (2020) *Beurteilung der Eignung eines VR-Systems als 3D Koordinatenmesssystem*. Proc.: Ingenieurvermessung 20, Beiträge zum 19. Internationalen Ingenieurvermessungskurs München, 2020, Wunderlich, T. (Hrsg.). Wichmann Verlag: 15-28

[P113] Schönberger C, **Lienhart W**, Lang E, Stary U (2020) *Erfahrungen aus 20 Jahre GPS Monitoring der Massenbewegung Gradenbach*. Proc.: Geomonitoring 2020: 149-162: https://doi.org/10.15488/9347

[P112] Wagner L, Kluckner A, Monsberger C, Wolf P, Prall, Schubert W, **Lienhart W** (2019) *Direct and Distributed Strain Measurements Inside a Shotcrete Lining: Concept and Realisation*, Rock Mech Rock Eng (2019): 10.1007/s00603-019-01923-4

[P111] Monsberger C, **Lienhart W**, Kluckner A, Schubert W (2019) *In-situ assessment of distributed strain and curvature characteristics in shotcrete tunnel linings based on fiber optic strain sensing*, Proc. International Congress of Rock Mechanics (ISRM): 1324–1331

[P110] Monsberger C, **Lienhart W** (2019) *In-situ Assessment of Curvature and Bending Characteristics Along Geotechnical Structures Using Distributed Fiber Optic Sensors*, Proceedings of the 12th International Workshop on Structural Health Monitoring 2019 (IWSHM): Enabling Intelligent Life-cycle Health Management for Industry Internet of Things (IIOT), DEStech Publications, Inc: 1715–1723

[P109] Monsberger C M, **Lienhart W** (2019) *Design, Testing, and Realization of a Distributed Fiber Optic Monitoring System to Assess Bending Characteristics Along Grouted Anchors*, Journal of Light Wave Technology 37 (2019): 4603–4609: 10.1109/JLT.2019.2913907

[P108] Winkler M, Monsberger C, **Lienhart W,** Vorwagner A, Kwapisz M (2019) *Assessment of crack patterns along plain concrete tunnel linings using distributed fiber optic sensing*, Proc. 5th International Conference on Smart Monitoring, Assessment and Rehabilitation of Civil Structures (SMAR): 8 pages

[P107] Monsberger C, Winkler M, Woschitz H, **Lienhart W,** Hayden M (2019) *5 years' experience using distributed fiber optic sensing along ductile driven piles*, Proc. 9th International Conference on Structural Health Monitoring of Intelligent Infrastructure (ISHMII): 1065–1070

[P106] **Lienhart W,** Buchmayer F, Klug F, Monsberger C (2019) *Distributed Fiber Optic Sensing on a Large Tunnel Construction Site: Increased Safety, More Efficient Construction and Basis for Condition-Based Maintenance*, Proc. International Conference on Smart Infrastructure and Construction (ICSIC) 2019: 595–604: 10.1680/icsic.64669.595 - **Best paper Award**

[P105] **Lienhart W** (2019) *State-of-the Art of Geotechnical Monitoring with Geodetic Techniques*, Geotechnical Engineering Journal of the SEAGS & AGSSEA, 50 (2): 13 – 20

[P104] Roberts GW, Hancock CM, Klug F, **Lienhart W**, Zuzek N, de Ligt H (2019) *Deflection Monitoring and frequency response of a Ship using GPS and Fibre Optic based sensors*, Proc. 4th Joint International Symposium on Deformation Monitoring (JISDM), Athens, Greece: 5 p

[P103] Buchmayer F, Monsberger C, **Lienhart W** (2019) *Benefits of strain and temperature monitoring of conventional tunnel cross sections using distributed fibre optic sensors*, Proc. 4th Joint International Symposium on Deformation Monitoring (JISDM), Athens, Greece: 7 p

[P102] Kalenjuk S, **Lienhart W**, Rebhan MJ, Marte R (2019) *Large-scale monitoring of retaining structures: new approaches on the safety assessment of retaining structures using mobile mapping*, Proceedings Volume 10970, Sensors and Smart Structures Technologies for Civil, Mechanical, and Aerospace Systems 2019; 109700T (2019): 10.1117/12.2513856

[P101] **Lienhart W**, Ehrhart M (2019) *Statische und dynamische Überwachung von Infrastrukturbauten mit kommerziellen Videotachymetern*, Proc. 20. Internationale Geodätische Woche Obergurgl 2019: 145–156

[P100] Monsberger C, **Lienhart W**, Moritz B (2018) *In-situ assessment of strain behaviour inside tunnel linings using distributed fibre optic sensors*, Geomechanics and Tunnelling 11 (2018), No. 6: 701–709: 10.1002/geot.201800050

[P99] **Lienhart W**, Monsberger C, Kalenjuk S, Woschitz W (2018) *High resolution monitoring of retaining walls with distributed fiber optic sensors and mobile mapping systems*, Proc. 7th Asia-Pacific Workshop on Structural Health Monitoring (APWSHM), Hong Kong: 9 p

[P98] Monsberger C, **Lienhart W**, Caporossi P (2018) *Distributed Fiber Optic Sensing along Grouted Anchors to Assess Curvature and Bending Characteristics*, Proc. 26th International Conference on Optical Fibre Sensors (OFS), Lausanne: 4 p

[P97] Gojcic Z, Kalenjuk S, **Lienhart W** (2018) *A Routine for Time Synchronization of Robotic Total Stations*. AVN 125: 299-307

[P96] Monsberger C, **Lienhart W**, Kluckner A, Wagner L, Schubert W (2018) *Continuous strain measurements in a shotcrete tunnel lining using distributed fiber optic sensing*, Proc. 9th European Workshop on Structural Health Monitoring (EWSHM), Manchester, United Kingdom: 13 p

[P95] Henzinger R, Schachinger T, **Lienhart W**, Buchmayer F, Weilinger W, Stefaner R, Haberler-Weber M, Haller E-M, Steiner M, Schubert W (2018) *Fibre-optic supported measurement methods for monitoring rock pressure*, Geomechanics and Tunnelling 11 (2018), No. 3: 251–263: 10.1002/geot.201800015

[P94] Monsberger C, **Lienhart W**, Hirschmüller S, Marte R (2018) *Monitoring of soil nailed slope stabilizations using distributed fiber optic sensing*, Proc. SPIE 10598, Sensors and Smart Structures Technologies for Civil, Mechanical, and Aerospace Systems 2018, 1059835 (27 March 2018): 10.1117/12.2296674

[P93] Kalenjuk S, **Lienhart W**, Rebhan M, Marte R (2018) *Neue Ansätze zur Zustandsbewertung bestehender Stützbauwerke basierend auf 3D-Modellen aus dynamischem Laserscanning*, Proc. Messen in der Geotechnik 2018. Stahlmann, J. (Hrsg.). Braunschweig: Institut für Grundbau und Bodenmechanik, TU Braunschweig, Band 104: 15 - 36

[P92] **Lienhart W** (2018) *Zustandsbeurteilung von Ingenieurbauwerken mittels statischem und kinematischem Laserscanning*, Proc. Fachtagung Bauwerksdiagnose 2018, DGZfP-Berichtsband BB 165: 11 p

[P91] **Lienhart W**, Kalenjuk S, Ehrhart C (2017) *Efficient and Large Scale Monitoring of Retaining Walls along Highways using a Mobile Mapping System.* Proc. 8th Int. Conf. on Structural Health Monitoring of Intelligent Infrastructure – SHMII-8, Brisbane, Australia: RS3-11, 8 p

[P90] Monsberger C, **Lienhart W** (2017) *In-situ Deformation Monitoring of Tunnel Segments using High-resolution Distributed Fibre Optic Sensing.* Proc. 8th Int. Conf. on Structural Health Monitoring of Intelligent Infrastructure – SHMII-8, Brisbane, Australia: RS1-9, 12 p

[P89] Klais F, Wolf P, **Lienhart W** (2017) *The Grautschenhof contract – Construction of an intermediate access under complex local conditions*, Geomechanics and Tunnelling 10 (2017), No. 6: 686–693: 10.1002/geot.201700052

[P88] **Lienhart W**, Monsberger C, Kalenjuk S (2017) *Linien- und flächenhaftes Strukturmonitoring mit geodätischen und geotechnischen Sensoren.* Proc. Messen im Bauwesen 2017, Bundesanstalt für Materialforschung und –prüfung (BAM), Berlin, Germany: 65-76

[P87] Ehrhart M, **Lienhart W**, Kalenjuk S (2017) *Monitoring of bridge vibrations with image-assisted total stations*. 4th Conference on Smart Monitoring, Assessment and Rehabilitation of civil Structures (SMAR), Zurich, Switzerland: 8 p

[P86] **Lienhart W**, Kalenjuk S (2017) *Combined Laser Scanning and Image Based Monitoring of Large Infrastructure Objects*. Proc. Int. Workshop on Structural Health Monitoring (IWSHM), Stanford, USA: 3147-3154

[P85] Gojcic Z, Kalenjuk S, **Lienhart W** (2017) *Synchronization routine for real-time synchronization of robotic total stations*. Proc. INGEO 2017 – 7th International Conference on Engineering Surveying, Lisbon, Portugal: 183-191

[P84] Ehrhart M, **Lienhart W** (2017) *Object tracking with robotic total stations: Current technologies and improvements based on image data*, Journal of Applied Geodesy 11(3): 131–142: 10.1515/jag-2016-0043

[P83] **Lienhart W** (2017) *Geotechnical monitoring using total stations and laser scanners: critical aspects and solutions*, Journal of Civil Structural Health Monitoring, 7(3): 315-324: 10.1007/s13349-017-0228-5

[P82] Ehrhart M, **Lienhart W** (2017) *Accurate Measurements with Image-Assisted Total Stations and Their Prerequisites*. J. Surv. Eng. 143(2): 04016024: 10.1061/(ASCE)SU.1943-5428.0000208

[P81] Kalenjuk S, **Lienhart W** (2017) *Automated Surface Documentation of Large Water Dams Using Image and Scan Data of Modern Total Stations*, Proc. FIG Working Week 2017 Surveying the world of tomorrow - From digitalisation to augmented reality, Helsinki, Finland: 15 p

[P80] **Lienhart W** (2017) *Ingenieurvermessung 2017*, Editor, Proc. 18th Internationaler Ingenieurvermessungskurs, Graz, Austria, Wichmann: 570 p

[P79] Monsberger C, Woschitz H, **Lienhart W**, Račanský V, Gächter D, Kulmer R (2017) *Überwachung von Ankerausziehversuchen im Rahmen der Hangsicherung für den Neubau einer Raffinerie*, Proc. 32nd Christian Veder Kolloquium 'Zugelemente in der Geotechnik', TU Graz, Gruppe Geotechnik 58: 173-192

[P78] Monsberger C, Klug F, **Lienhart W** (2017) *Performance assessment of a fiber Bragg grating sensor network inside a hydro power dam using optical backscatter*, Proc. SPIE. 10208, Fiber Optic Sensors and Applications XIV, 102080R, Anaheim, USA: 10.1117/12.2262410

[P77] Monsberger C, Woschitz H, **Lienhart W**, Račanský V (2017) *Performance assessment of geotechnical structural elements using distributed fiber optic sensing*, Proc. SPIE 10168, Sensors and Smart Structures Technologies for Civil, Mechanical, and Aerospace Systems 2017, 101680Z, Portland, USA: 10.1117/12.2256711

[P76] Kalenjuk S, **Lienhart W**, Wackenreuther H (2017) *Automatisierte Oberflächendokumentation von Talsperren mittels bildunterstützter Totalstationen*, Proc. 19. Internationale Geodätische Woche, Obergurgl, Austria: 109-118

[P75] **Lienhart W**, Ehrhart M, Grick M (2017) *High Frequent Total Station Measurements for the Monitoring of Bridge Vibrations*, Journal of Applied Geodesy 11 (1): 1 – 8: 10.1515/JAG-2016-0028

[P74] Račanský V, **Lienhart W**, Monsberger C, Woschitz H, Chalmovsky J (2016) *Ground Anchor Monitoring with Fiber Optic Sensing,* Proc. 44. Conference on Foundation Engineering, Brno, Czech Republic: 6 p

[P73] Döring H, Habel W, **Lienhart W**, Schwarz W (2016) *Faseroptische Messverfahren,* Handbuch der Geodäsie, Band Ingenieurgeodäsie: 48 p: 10.1007/978-3-662-46900-2_22-1

[P72] Moser F, **Lienhart W**, Woschitz H, Schuller H (2016) *Long-term monitoring of reinforced earth structures using distributed fiber optic sensing,* Journal of Civil Structural Health Monitoring (2016) 6: 321-327: 10.1007/S13349-016-0172-9

[P71] Gehwolf P, Monsberger C, Barwart S, Wenighofer R, Galler R, **Lienhart W**, Haberler-Weber M, Moritz B, Barwart C, Lange A (2016) *Deformation measurements of tunnel segments at a newly developed test rig*, Geomechanics and tunnelling (Geomechanik und Tunnelbau) 9, 3: 180 – 187: 10.1002/geot.201600012

[P70] **Lienhart W**, Wiesmeyr C, Wagner R, Klug F, Litzenberger M, Maicz D (2016) *Condition monitoring of railway tracks and vehicles using fibre optic sensing techniques*, Proc. International Conference on Smart Infrastructure and Construction, (ICSIC), Cambridge, ICE Publishing: 45-50

[P69] **Lienhart W** (2016) *Critical Aspects when using Total Stations and Laser Scanners for Geotechnical Monitoring*, Proc. Civil Structural Health Monitoring Workshop (CSHM-6), Belfast: 8 p

[P68] Klug F, Lackner S, **Lienhart W** (2016) *Monitoring of Railway Deformations using Distributed Fiber Optic Sensors*, Proc. Joint International Symposium on Deformation Monitoring (JISDM), Vienna, Austria: 8 p

[P67] **Lienhart W**, Ehrhart M, Grick M (2016) *High Frequent Total Station Measurements for the Monitoring of Bridge Vibrations*, Proc. Joint International Symposium on Deformation Monitoring (JISDM), Vienna, Austria: 8 p

[P66] Lackner S, **Lienhart W** (2016) *Impact of Prism Type and Prism Orientation on the Accuracy of Automated Total Station Measurements*, Proc. Joint International Symposium on Deformation Monitoring (JISDM), Vienna, Austria: 8 p

[P65] **Lienhart W** (2016) *Überwachung von geotechnischen Objekten und Infrastrukturbauten mit faseroptischen Sensoren*, Proc. Geomonitoring 2016, Braunschweig, Germany: 55 - 68

[P64] Monsberger C, Woschitz H, Hayden M, **Lienhart W** (2016) *Faseroptische Instrumentierung und Deformationsmessung eines duktilen Rammpfahls*, Proc. Messen in der Geotechnik 2016. Stahlmann, J. (Hrsg.). Braunschweig: Institut für Grundbau und Bodenmechanik, TU Braunschweig, Band 101: S. 195 - 216

[P63] Lackner S, **Lienhart W**, Supp G, Marte R (2016) *Geodetic and fibre optic measurements of a full-scale bi-axial compressional test*, Survey Review, Volume 48, 2016 - Issue 347: 86-93: 10.1179/1752270614Y.0000000145

[P62] Ehrhart M, **Lienhart W** (2015) *Monitoring of civil engineering structures using a state-of-the-art image assisted total station*, Journal of Applied Geodesy 9 (2015): 174 – 182: 10.1515/JAG-2015-0005

[P61] **Lienhart W** (2015) *Case studies of high-sensitivity monitoring of natural and engineered slopes*, Journal of Rock Mechanics and Geotechnical Engineering 7 (2015): 379 – 384: 10.1016/J.JRMGE.2015.04.002

[P60] **Lienhart W**, Ehrhart M (2015) *State of the Art of Geodetic Bridge Monitoring*, Proc. Int. Workshop on Structural Health Monitoring (IWSHM), Stanford, USA: 449 – 456: 10.12783/SHM2015/58

[P59] Moser F, **Lienhart W**, Woschitz H, Schuller H (2015) *Long term monitoring of reinforced earth structures using distributed fiber optic sensing*, Proc. 7th Int. Conf. on Structural Health Monitoring of Intelligent Infrastructure – SHMII, Turin, Italy: 10 p

[P58] **Lienhart W**, Klug, F (2015) *Continuous monitoring of a large concrete arch dam using Fibre Bragg Grating sensors*, Proc. 7th Int. Conf. on Structural Health Monitoring of Intelligent Infrastructure – SHMII, Turin, Italy: 10 p

[P57] **Lienhart W**, Klug F (2015) *New concepts for the monitoring of concrete joints movements of water dams in pump-storage operation*, Proc. 83. ICOLD Annual Meeting, Stavanger, Norway: 207 - 223

[P56] Woschitz H, Klug F, **Lienhart W** (2015) *Design and calibration of a fiber optic monitoring system for the determination of segment joint movements inside a hydro power dam*, Journal of Light Wave Technology 33 (2015): 2652 – 2657: 10.1109/JLT.2014.2370102

[P55] **Lienhart W** (2015) *Micrometre-level Deformation Monitoring of a Concrete Dam*, GIM International, 6 (29): 16:19

[P54] Ehrhart M, **Lienhart W** (2015) *Development and evaluation of a long range image-based monitoring system for civil engineering structures*, Proc. Smart Structures/NDE, SPIE Vol. 9437. (2015): 13p: 10.1117/12.2084221

[P53] **Lienhart W**, Klug F (2015) *Erfassung und Analyse der Blockfugenbewegungen einer Staumauer im Pumpspeicherbetrieb,* Proc. 18. Internationale Geodätische Woche Obergurgl: 54-63

[P52] Ehrhart M, **Lienhart, W** (2015) *Image-based dynamic deformation monitoring of civil engineering structures from long ranges*, Proc. Image Processing: Machine Vision Applications VIII, SPIE Vol. 9405. (2015): 14p: 10.1117/12.2075888

[P51] **Lienhart W** (2015) *Totalstationen für Deformationsmessungen*, GeoNews, 1 (2015): 6-7

[P50] **Lienhart W**, Woschitz H, Moser F (2014) *High Sensitive Monitoring of Natural and Engineered Slopes*, Proc. 5th International Forum on Opto-electronic Sensor-based Monitoring in Geo-engineering (OSMG), Nanjing, China: 8-14

[P49] **Lienhart W,** Moser F, Schuller H, Schachinger T (2014) *Reinforced Earth Structures at Semmering Base Tunnel - Construction and Monitoring using Fiber Optic Strain Measurements*, Proc. 10th International Conference on Geosynthetics (10ICG), Berlin, Germany: 8 pages

[P48] Klug F, **Lienhart W**, Woschitz H (2014) *High resolution monitoring of expansion joints of a concrete arch dam using fiber optic sensors*, Proc. 6th World Conference of the International Association for Structural Control and Monitoring (IASCM), Barcelona, Spain: 3164-3176

[P47] Schuller H, Schwingshackl I, Schachinger T, Moser F, **Lienhart W** (2014) *Semmering-Basistunnel neu, Bewehrte-Erde-Konstruktion - Ausführung und Monitoring mit faseroptischen Messsystemen*, Berg- und hüttenmännische Monatshefte, 159, 12: 490-498: 10.1007/S00501-014-0312-7

[P46] Woschitz H, **Lienhart W,** Klug F (2014) *Fibre optic monitoring system for the determination of segment joint movements inside a hydro power dam*, SPIE Proceedings Vol. 9157: 4 pages: 10.1117/12.2059682

[P45] **Lienhart W**, Woschitz H, Klug F (2014) *Faseroptische Überwachung von Blockfugenbewegungen einer Talsperre,* In: Wieser A (ed): Ingenieurvermessung 14, Proc. 17th International Engineering Surveying Course, Zurich, Switzerland: 371-380

[P44] Supp G, Marte R, Lackner S, **Lienhart W** (2014) *Großmaßstäbliche Böschungsbruchversuche mit und ohne Sicherungsmassnahmen*, Proc. 9th Kolloquium Bauen in Boden und Fels: 275-284

[P43] Schuller H, Schwingshackl I, Schachinger T, Moser, F, **Lienhart W** (2014) *Semmering Basistunnel neu - faseroptische Messsysteme zur Erfassung der Dehnungen beim Bau von Bewehrte-Erde-Stützkonstruktionen in der Deponie Longsgraben*, Proc. Messen in der Geotechnik, Mitteilung des Institutes für Grundbau und Bodenmechanik, TU Braunschweig 98: 291-311

[P42] Marte R, Supp G, **Lienhart W** (2014) *Böschungsbruch Großversuche - begleitet durch ein intensives Messprogramm*, Proc. Messen in der Geotechnik, Mitteilung des Institutes für Grundbau und Bodenmechanik, TU Braunschweig 98: 187-204

[P41] Schuller H, Schwingshackl I, Schachinger T, Moser, F, **Lienhart W** (2014) *Semmering Basistunnel neu - geotechnisches Monitoring mit faseroptischen Messsystemen beim Bau von Bewehrte-Erde-Stützkonstruktionen in der Deponie Longsgraben*, Proc. 29th Christian Veder Kolloquium 'Stützmaßnahmen in der Geotechnik', TU Graz, Gruppe Geotechnik 51: 107-122

[P40] **Lienhart W** (2013) *Challenges in the analysis of inhomogeneous structural monitoring data,* Journal of Civil Structural Health Monitoring 3 (2013) 4: 247-255: 10.1007/s13349-013-0051-6

[P39] **Lienhart W**, Lackner S, Moser M, Woschitz H, Supp G (2013) *Deformation Monitoring of Flood Prevention Dams using Geodetic and Fibre Optic Measurement Techniques*, Proc. 6th Int. Conference on Structural Health Monitoring of Intelligent Infrastructure (SHMII-6), Hong Kong, China: 8 pages

[P38] **Lienhart W** (2013) *Integrated Analysis of Inhomogeneous Structural Monitoring Data from Internal and External Sensors*, Proc. 2nd Conference on Smart Monitoring, Assessment and Rehabilitation of civil Structures (SMAR), Istanbul, Turkey: 8 pages

[P37] **Lienhart W**, Lackner S, Supp G, Marte R (2013) *Evaluation of State of the Art Methods for Surface Monitoring of Earth Filled Dams*, Proc. 2nd Joint International Symposium on Deformation Monitoring (JISDM), Nottingham, UK: 8 pages

[P36] **Lienhart W**, Moser M, Supp G, Marte R (2013) *Verification of the Slope Stability of Flood Prevention Dams with Fiber Optic Sensors*, Proc. 9th Int. Workshop on Structural Health Monitoring (IWSHM), Stanford, USA: 9 pages

[P35] **Lienhart W** (2013) *Deformationsmessungen eines Erddammes mit faseroptischen Sensoren.* Proc. 3. Tagung Messtechnik, Vienna, Austria: 83-87

[P34] Schukar V; Kusche N; Hofmann D; Basedau, F; Habel W; Woschitz H; **Lienhart W** (2013) *Field examples for optical fibre sensor condition diagnostics based on distributed fibre-optic strain sensing.* Proc. 5th European Workshop on Optical Fibre Sensors (EWOFS), 4 pages: 10.1117/12.2025567

[P33] **Lienhart W** (2013) *Die Bedeutung von faseroptischen Messsystemen für ingenieurgeodätische Überwachungsmessungen.* Proc. 2. Darmstädter Ingenieurkongress – Bau und Umwelt, Darmstadt, Shaker Verlag: 591-595

[P32] **Lienhart W**, Brunner FK (2013) *Geodätische Überwachung von gravitativen Massenbewegungen am Beispiel des Gradenbach-Observatoriums*. ZfV 138: 64-74

[P31] Brunner FK, **Lienhart W** (2012) *Anwendung der Lokalen-Maßstab-Parameter Methode (LSPM) bei der Vermessung einer Kalibrierbasis*. AVN 119: 363-368

[P30] **Lienhart W** (2012) *Challenges in the Analysis of Inhomogeneous Structural Monitoring Data*. Proc. Civil Structural Health Monitoring Workshop (CSHM-4), Berlin, Lecture 15, 9 pages

[P29] **Lienhart W** (2012) *Analyse von Deformationsmessungen mit kausalen Auswertemodellen,* Proc. 115. DVW-Seminar Interdisziplinäre Messaufgaben im Bauwesen - Weimar 2012, Vol. 68: 203 - 218

[P28] **Lienhart W** (2011) *Integrated digital imaging and its impact on survey workflows*. PositionIT, Aug./Sept. 2011: 51-55

[P27] **Lienhart W** (2011) *The impact of image assisted surveying and image based documentation on traditional surveying workflows*, Proc. AfricaGEO – Developing Geomatics for Africa, 11 pages

[P26] **Lienhart W**, Nindl D (2011) *Bildunterstützte Vermessung und Dokumentation*. In: Grimm-Pitzinger A, Weinold T (eds): Proc. 16. International Geodetic Week Obergurgel, Austria: 244-252

[P25] **Lienhart W**, Merk G (2010) *"Vom Feld ins Internet" – ein Beispiel zur Nutzung internetfähiger Mobilkommunikation bei der Messwerterfassung und Visualisierung von Deformationsmessungen*. In: Wunderlich T FK (ed): Ingenieurvermessung 10, Proc. 16. International Engineering Surveying Course, Munich, Germany: 183-195

[P24] Zogg H-M, **Lienhart W**, Nindl D (2009) *Advances in Total Station Design for Highest Accuracy and Performance*, Proc. 9th Conference on Optical 3-D Measurement Techniques, Vienna, Austria: 191-200

[P23] Zogg H-M, **Lienhart W**, Nindl D (2009) *Leica TS30: The Art of Achieving Highest Accuracy and Performance*. White Paper, Leica Geosystems AG: 11 pages

[P22] **Lienhart W** (2009) *Leica GPS1200+: The only future proof GNSS receiver*. White Paper, Leica Geosystems AG: 6 pages

[P21] **Lienhart W** (2009) *Interoperability of GLONASS Observations for RTK Positioning Applications*. In: Chesi G, Weinold T (eds): Proc. 15. International Geodetic Week Obergurgel, Austria: 258-267

[P20] **Lienhart W**, Zogg H-M, Nindl D (2009) *Innovative Lösungen zur Ereichung höchster Genauigkeit und Geschwindigkeit am Beispiel der TS30 Totalstation von Leica Geosystems.* AVN 11-12/2009: 374-381

[P19] Nindl D, **Lienhart W**, Zogg H-M (2009) *Neueste Entwicklungen und Technologien für modernste Totalstationen mit höchster Messgenauigkeit.* Geomatik Schweiz 8/2009: 411-415

[P18] **Lienhart W** (2008) *New approaches to improve rover positions using standardized RTCM network information based on the Master Auxiliary Concept*, Proc. EUPOS-GNSS Symposium, Berlin, Germany: 63-66

[P17] Takac F, **Lienhart W** (2008) *A Novel Method of Processing Standardized RTCM Network RTK Information for High-Precision Positioning*, Proc. ENC-GNSS 2008, Toulouse, Frankreich: 9 pages

[P16] **Lienhart W**, Takac F (2008) *SmartRTK: Eine neue Methode zur Berechnung standardisierter RTCM-Netzwerkinformationen für hochpräzise RTK-Anwendungen.* AVN 6/2008: 202-209

[P15] **Lienhart W**, Jordan A (2008) *RTK Networks: An Introduction*. Leica System 1200 Newsletter, Leica Geosystems AG: 5 pages

[P14] **Lienhart W**, Jordan A (2008) *RTK Networks: Different Methods*. Leica System 1200 Newsletter, Leica Geosystems AG: 6 pages

[P13] **Lienhart W**, Ostridge R (2008) *RTK Networks: A Case Study*. Leica System 1200 Newsletter, Leica Geosystems AG: 6 pages

[P12] **Lienhart W** (2008) *Geodätische Deformationsanalyse und Structural Health Monitoring: Chancen und Herausforderungen für die Geodäsie*. In: Universalgeodäsie in Graz, Austria: 128-139

[P11] **Lienhart W**, Brunner FK (2007) *Integrated Analysis of Inhomogeneous Structural Monitoring Data of a Monolithic Bridge*, Proc. 3. International Conference on Structural Health Monitoring of Intelligent Infrastructure, Vancouver, Canada

[P10] **Lienhart W**, Brunner FK (2007) *Integrierte Auswertung von inhomogenen Überwachungsdaten am Beispiel einer monolithischen Brücke*. In: Brunner FK (ed): Ingenieurvermessung 07, Proc. 15. International Engineering Surveying Course, Graz, Austria: 295-309

[P9] **Lienhart W** (2007) *Analysis of Inhomogeneous Structural Monitoring Data*. PhD Thesis, TU Graz, 2006, Engineering Geodesy – TU Graz, Shaker, Aachen, Germany: 300 pages

[P8] **Lienhart W** (2005) *Experimental Investigation of the Performance of the SOFO Measurement System*. In: Chang FK (ed): Structural Health Monitoring 2005, Proc. 5th International Workshop on Structural Health Monitoring, Stanford, USA: 1131-1138

[P7] **Lienhart W**, Brunner FK (2004) *Monitoring einer Brücke mit geodätischen Methoden und faseroptischen Sensoren*. In: Ingensand H (ed): Ingenieurvermessung 2004, Proc. 14. Internationaler Ingenieurvermessungskurs, Zurich, Switzerland: 81 – 92

[P6] **Lienhart W**, Brunner FK (2004) *Temperaturabhängigkeit der Kreiselmessungen mit einem GYROMAT 2000*. ZfV 129: 235-242

[P5] Högler H, **Lienhart W** (2003) *Integrales Brückenbauwerk zur Straßenverbreiterung und erste Deformationsmessungen mit faseroptischen Sensoren*. In: VDI Berichte, 1757: 221-231

[P4] **Lienhart W**, Brunner FK (2003) *Monitoring of Bridge Deformations using Embedded Fiber Optical Sensors*. In: Stiros St, Pytharouli St (eds): Proc 11th International Symposium on Deformation Measurements, Santorini, Greece: 555-561

[P3] Wieser A, **Lienhart W**, Brunner FK (2003) *Nachbarschaftstreue Transformation zur Berücksichtigung von Spannungen im amtlichen Festpunktfeld*. Österreichische Zeitschrift für Vermessung und Geoinformation 91: 115-122

[P2] **Lienhart W**, Wieser A, Brunner FK (2003) *Ausreißerdetektion bei der Positionsbestimmung in aktiven GPS Netzen*. AVN 5/2003: 177-182

[P1] **Lienhart W**, Wieser A, Brunner FK (2002) *Positioning by an Active GPS System: Experimental Investigation of the Attainable Accuracy*. In: Proc FIG XXII Congress, Washington D.C. USA: 12 pages

VI. Presentations

[101] 17.06.2021, *Monitoring of Large Concrete Structures*. Public Webinar of Fiber Optic Sensing Association (FOSA), https://www.youtube.com/watch?v=Ren1F8Yku7c

[T100] 14.06.2021, *Panel discussion: Geotechnical and Structural Monitoring in Academia*. 7th International Course on Geotechnical and Structural Monitoring (ICGSM) - **invited presentation**

[T99] 18.05.2021, *Fiber Optics*. Virtual Well Integrity Platform (WIP) Workshop, online conference - **invited presentation**

[T98] 05.03.2021, *Verteilte faseroptische Sensorik zur Detektion, Lokalisation, Identifikation und Quantifikation von Deformationsereignissen*. GeoMonitoring 2021, online conference - **invited presentation**

[T97] 09.02.2021, *VR gestützte Planung von geodätischen Netzmessungen*. 21st Internationale Geodätische Woche Obergurgl, online conference

[T96] 02.12.2020, *Fibre Optic Sensing (FOS) in Railways,* Round Table discussion at Rail Live Virtual, online conference - **invited presentation**

[T95] 26.11.2020, *Temperaturüberwachung von faseroptischen Kommunikationsleitungen der Wiener Netze,* 8. VKÖ-Stadtwerketag 2020, online conference - **invited presentation**

[T94] 21.10.2020, *Faseroptische Sensorik im Tunnelbau,* ÖVG-Forum Lichtwellenleitersensorik im Eisenbahnwesen, Vienna, Austria - **invited presentation**

[T93] 16.11.2020, *Alles regt sich, alles bewegt sich - Rutschungs- und Überwachungsmessungen,* Weiterbildungsveranstaltung "Vermessung aktuell", Innsbruck, Austria - **invited presentation**

[T93] 05.03.2020, *Deformationsmessungen mit Kameras,* Internationalen Ingenieurvermessungskurs, Munich, Germany - **invited presentation**

[T92] 09.01.2020, *Moderne Bauwerksüberwachung in Zeiten von Big Data und Industrie 4.0,* Geodätisches Kolloquium, Karlsruher Institute of Technology (KIT), Karlsruhe, Germany - **invited presentation**

[T91] 19.11.2019, *Faseroptisch unterstützte Messmethoden zur Beobachtung von Gebirgsdruck,* VIF FORUM 2019, Vienna, Austria - **invited presentation**

[T90] 14.10.2019, *Überwachung der Bauwerksicherheit im Kontext aktueller Großbauvorhaben,* Austrian Disaster Research Days 2019, Graz, Austria - **invited presentation**

[T89] 19.09.2019, *Grobdetektion von Deformationen und Schadstellen von Stützmauern,* Voebu Seminar: FFG SIBS: Sicherheitsbewertung bestehender Stützbauwerke, Vienna, Austria - **invited presentation**

[T88] 18.09.2019, *Optical surveillance of high pressure,* Distribution Committee Meeting, International Gas Union (IGU), Prague, Czech Republic - **invited presentation**

[T87] 28.08.2019, *Assessment of crack patterns along plain concrete tunnel linings using distributed fiber optic sensing,* 5th International Conference on Smart Monitoring, Assessment and Rehabilitation of Civil Structures (SMAR), Potsdam, Germany

[T86] 08.07.2019, *Distributed Fiber Optic Sensing on a Large Tunnel Construction Site: Increased Safety, More Efficient Construction and Basis for Condition-Based Maintenance,* International Conference on Smart Infrastructure and Construction (ICSIC) 2019, Cambridge, UK

[T85] 28.05.2019, *Master Class: Total Stations*, 6th International Course on Geotechnical and Structural Monitoring (IcGSM), Rome, Italy - **invited presentation**

[T84] 11.02.2019, *Statische und dynamische Überwachung von Infrastrukturbauten mit kommerziellen Videotachymetern*, 20. Internationale Geodätische Woche Obergurg, Austria

[T83] 24.01.2019, *Monitoring von Stützmauern*, Burgdorfer Geotechniktag 2019, Burgdorf, Switzerland - **invited presentation**

[T82] 23.11.2018, *Monitoring von Brückenkonstruktionen mit neuen Methoden*, Kulinarischer Bautreff – Die Bauwirtschaft im Wandel, Franzensfeste, Italy - **invited presentation**

[T81] 14.11.2018, *High resolution monitoring of retaining walls with distributed fiber optic sensors and mobile mapping systems*, 7th Asia-Pacific Workshop on Structural Health Monitoring (APWSHM), Hong Kong

[T80] 07.11.2018, *Statische und dynamische Bauwerksüberwachung mit linien- und flächenhaften Sensoren*, OVG Vortragsreihe, Vienna, Austria - **invited presentation**

[T79] 06.06.2018, *Aktueller Status Forschungsprojekt Pipe Sense: Statische und dynamische Überwachung von Gasleitungen mittels faseroptischer Sensoren*, 128. ÖVGW-Jahrestagung, Salzburg, Austria - **invited presentation**

[T78] 23.05.2018, *Monitoring of Displacement by Total Station, Laser Scanner and GNSS: Guidelines and Lessons Learned*, 5th International Course on Geotechnical and Structural Monitoring (IcGSM), Rome, Italy - **invited presentation**

[T77] 21.05.2018, *Total Stations*, Master Class held at the 5th International Course on Geotechnical and Structural Monitoring (IcGSM), Rome, Italy - **invited presentation**

[T76] 03.05.2018, *Drowning in data: The curse of high resolution structural health monitoring*, Geomatik Seminar, ETH Zurich, Switzerland - **invited presentation**

[T75] 19.04.2018, *Geotechnisches Monitoring mit geodätischen und faseroptischen Sensoren: Aktuelle Entwicklungen und neue Möglichkeiten mit hochauflösenden Messverfahren*, Geodätisches Kolloquium, HafenCity Universität, Hamburg, Germany - **invited presentation**

[T74] 15.02.2018, *Zustandsbeurteilung von Ingenieurbauwerken mittels statischem und kinematischem Laserscanning*, DGZfP Fachtagung Bauwerksdiagnose 2018, Berlin, Germany - **invited presentation**

[T73] 11.01.2018, *Monitoring mit modernen Totalstationen: Kritische Komponenten und neue Möglichkeiten durch optimale Nutzung der integrierten Sensoren*. Geodätisches Kolloquium, Frankfurt University of Applied Sciences, Germany - **invited presentation**

[T72] 14.12.2017, *Hochauflösende Deformationsmessungen von Ingenieurbauten mit geodätischen und faseroptischen Sensoren*. Geodätisches Kolloquium, RWTH Aachen, Germany - **invited presentation**

[T71] 08.12.2017, *Efficient and Large Scale Monitoring of Retaining Walls along Highways using a Mobile Mapping System*. 8th Int. Conf. on Structural Health Monitoring of Intelligent Infrastructure – SHMII-8, Brisbane, Australia

[T70] 16.11.2017, *Die Geister, die man rief – Der begrenzte Nutzen von hochfrequenten und hochauflösenden Monitoringdaten*. VoGIS Fachforum 2017, „Alles misst!“, Feldkirch, Austria - **invited presentation**

[T69] 14.11.2017, *Linien- und flächenhaftes Strukturmonitoring mit geodätischen und geotechnischen Sensoren*. Messen im Bauwesen 2017, Bundesanstalt für Materialforschung und –prüfung (BAM), Berlin, Germany - **invited presentation**

[T68] 05.11.2017, *New approaches to monitor geotechnical structures using mobile mapping systems, fiber optic sensors and image based techniques*. 6th International Forum on Opto-electronic Sensor-based Monitoring in Geo-engineering (OSMG). Nanjing University, China - **invited presentation**

[T67] 26.09.2017, *Einsatz von kommerziellen Videotachymetern zur statischen und dynamischen Überwachung von Infrastrukturbauten*. Intergeo 2017, Berlin, Germany – **invited presentation**

[T66] 14.09.2017, *Combined Laser Scanning and Image Based Monitoring of Large Infrastructure Objects*. Int. Workshop on Structural Health Monitoring (IWSHM), Stanford, USA

[T65] 04.07.2017, *Hochauflösende Deformationsmessungen von Tunneltübbingen mit verteilten faseroptischen Sensoren*. VDI-Fachkonferenz Tunnelbau, Raunheim bei Frankfurt, Germany - **invited presentation**

[T64] 14.06.2017, *Monitoring of Displacements by Topographic and GNSS Systems: Guidelines and Lessons Learned*. IV International Course on Geotechnical and Structural Monitoring, Rome, Italy - **invited presentation**

[T63] 25.04.2017, *Richtig Arbeiten mit modernen Totalstationen*. Tutorial at 18th International Engineering Surveying Course, TU Graz, Austria

[T62] 20.04.2017, *Überwachung von Ankerausziehversuchen im Rahmen der Hangsicherung für den Neubau einer Raffinerie*. 32nd Christian Veder Kolloquium 'Zugelemente in der Geotechnik', Graz, Austria

[T61] 27.06.2016, *Condition monitoring of railway tracks and vehicles using fibre optic sensing techniques*. International Conference on Smart Infrastructure and Construction, (ICSIC), Cambridge, UK

[T60] 31.05.2016, *Rissdetektion und Langzeitüberwachung von Bauteilen, Brücken und Staumauern mit faseroptischen Sensoren*. Geodätisches Kolloquium, Leibniz Universität Hannover, Germany - **invited presentation**

[T59] 27.05.2016, *Critical Aspects when using Total Stations and Laser Scanners for Geotechnical Monitoring*. Civil Structural Health Monitoring Workshop (CSHM-6), Belfast, UK - **invited presentation**

[T58] 07.04.2016, *Zufällige und systematische Fehler bei geodätischen Überwachungs-messungen*. ATCOLD-Kolloquium: Sichere Talsperren & Speicherbauwerke, Graz, Austria - **invited presentation**

[T57] 31.03.2016, *High Frequent Total Station Measurements for the Monitoring of Bridge Vibrations*. Joint International Symposium on Deformation Monitoring (JISDM), Vienna, Austria

[T56] 03.03.2016, *Überwachung von geotechnischen Objekten und Infrastrukturbauten mit faseroptischen Sensoren*. Geomonitoring 2016, Braunschweig, Germany

[T55] 24.09.2015, *Überwachungsprojekte mit faseroptischen Sensoren*. Austrian National Committee on Large Dams (ATCOLD) AK Betrieb, Überwachung und Instandhaltung von Stauanlagen, Herbsttagung 2015, Stubachtal, Austria – **invited presentation**

[T54] 01.09.2015, *State of the Art of Geodetic Bridge Monitoring*. Int. Workshop on Structural Health Monitoring - IWSHM, Stanford, USA

[T53] 01.07.2015, *Continuous monitoring of a large concrete arch dam using Fibre Bragg Grating sensors*. 7th Int. Conf. on Structural Health Monitoring of Intelligent Infrastructure - SHMII, Turin, Italy

[T52] 19.06.2015, *New concepts for the monitoring of concrete joints movements of water dams in pump-storage operation*. 83rd ICOLD Annual Meeting, Stavanger, Norway

[T51] 05.05.2015 *Fehlereinflüsse bei automatisierten Überwachungsmessungen mit Totalstationen*. 12th Österreichischer Geodätentag, Velden, Austria – **invited presentation**

[T50] 16.04.2015, *Messtechnische Überwachung von bewehrte Erde-Konstruktionen*. ZT-Forum Seminar: Bewehrte-Erde-Konstruktionen - Planung, Ausführung und praktische Fallbeispiele, Graz, Austria

[T49] 09.02.2015, Erfassung und Analyse der Blockfugenbewegungen einer Staumauer im Pumpspeicherbetrieb. 18th Internationale Geodätische Woche Obergurgl, Obergurgl, Austria

[T48] 21.11.2014, *Langzeitüberwachung von Hangbewegungen mit GNSS und faseroptischen Sensoren*. AHORN 2014 - der Alpenraum und seine

Herausforderungen im Bereich Orientierung und Navigation und Informationsaustausch, Graz, Austria

[T47] 06.11.2014, *Semmering-Basistunnel neu, Bewehrte-Erde-Konstruktionen - Ausführung und Monitoring mit faseroptischen Messsystemen*. Spezialtiefbau im Tunnelbau. Montanuniversiät Leoben, Austria

[T46] 17.10.2014, *Structural Monitoring using Geodetic and Fibre Optic Sensors*. Lecture at The University of Nottingham, Ningbo, China – **invited presentation**

[T45] 13.10.2014, *High Sensitive Monitoring of Natural and Engineered Slopes*. 5th International Forum on Opto-electronic Sensor-based Monitoring in Geo-engineering (OSMG). Nanjing University, China – **invited presentation**

[T44] 01.07.2014, *Laboratory and field validation of fibre optic strain measurements*. The Cambridge Conference on Fibre Optic Sensing in Civil Infrastructure (CamFOS). University of Cambridge, UK – **invited presentation**

[T43] 24.04.2014, *Semmering-Basistunnel neu - geotechnisches Monitoring mit faseroptischen Messsystemen beim Bau von Bewehrte-Erde-Stützkonstruktionen in der Deponie Longsgraben*. 29th Christian-Veder-Kolloquium "Stützmaßnahmen in der Geotechnik", Graz, Austria

[T42] 13.03.2014, *Herausforderungen bei der Messung und Auswertung von Deformationen im Inneren von Objekten*. 60 Jahre Geodäsie in Weimar "Geodäsie - Wofür?", Bauhaus-Universität Weimar, Germany – **invited presentation**

[T41] 15.01.2014, *Richtig Arbeiten mit modernen TPS*. Tutorial at 17th International Engineering Surveying Course, ETH Zurich, Switzerland

[T40] 14.01.2014, *Faseroptische Überwachung von Blockfugenbewegungen einer Talsperre*. 17th International Engineering Surveying Course, ETH Zurich, Switzerland

[T39] 09.12.2013, *Deformation Monitoring of Flood Prevention Dams using Geodetic and Fibre Optic Measurement Techniques*. 6th International Conference on Structural Health Monitoring of Intelligent Infrastructure (SHMII-6), Hong Kong, China

[T38] 05.12.2013, *Hochauflösende Erfassung und integrierte Auswertung von Deformationen*. Geodetic Colloquium, Braunschweig Technical University, Braunschweig, Germany – **invited presentation**

[T37] 07.11.2013, *Hangrutschungen, Tunnelbauten und Pumpspeicherkraftwerke – Aktuelle ingenieurgeodätische Herausforderungen in Österreich*. Österreichische Geodätische Kommission (ÖGK) – 150 Jahre für den Fortschritt der Geodäsie, Vienna, Austria – **invited presentation**

[T36] 09.09.2013, *Integrated Analysis of Inhomogeneous Structural Monitoring Data from Internal and External Sensors*. 2nd Conference on Smart Monitoring Assessment and Rehabilitation (SMAR), Istanbul, Turkey

[T35] 14.05.2013, *Deformationsmessungen eines Erddammes mit faseroptischen Sensoren*. 3. Tagung Messtechnik, Vienna, Austria

[T34] 12.03.2013, *Die Bedeutung von faseroptischen Messsystemen für ingenieurgeodätische Überwachungsmessungen*. 2. Darmstädter Ingenieurkongress – Bau und Umwelt, Darmstadt, Germany

[T33] 22.01.2013, *Dammüberwachung mit geodätischen und faseroptischen Methoden*. Leica Geosystems & rmData Tour 2013, Vienna, Austria – invited presentation

[T32] 21.11.2012, *Wenn Genauigkeit zählt – Ingenieurgeodätische Überwachung von künstlichen und natürlichen Strukturen*. Antrittsvorlesung, Geo – Colloquium, Austrian Society for Surveying and Geoinformation, Graz, Austria

[T31] 07.11.2012, *Challenges in the Analysis of Inhomogeneous Structural Monitoring Data*. Civil Structural Health Monitoring Workshop (CSHM-4), Berlin, Germany

[T30] 19.10.2012, *Faseroptische Messsysteme als Teil moderner geodätischer Sensorik*. Forbildungsveranstaltung "Vermessung aktuell" zum Thema "Geodätische Messtechnik - Grundlagen, Methoden, Anwendungen", University Innsbruck, Austria – **invited presentation**

[T29] 09.10.2012, *Neue Technologien zur flächenhaften Messung von Oberflächen und deren Deformationen*. Intergeo 2012, Hannover, Germany – **invited presentation**

[T28] 26.09.2012, *Analyse von Deformationsmessungen mit kausalen Auswertemodellen*. Interdisziplinäre Messaufgaben im Bauwesen, Bauhaus-Universität Weimar, Germany

[T27] 25.09.2012, *Integrierte Auswertung von internen und externen Messdaten*. Seminar: Faseroptische Sensoren - Messsysteme mit Zukunft, Bauhaus-Universität Weimar, Germany

[T26] 24.09.2012, *Übersicht über kommerziell verfügbare faseroptische Messsysteme*. Seminar: Faseroptische Sensoren - Messsysteme mit Zukunft, Bauhaus-Universität Weimar, Germany

[T25] 24.09.2012, *Kalibrierung und Zuverlässigkeitsbeurteilung von faseroptischen Messsystemen*. Seminar: Faseroptische Sensoren - Messsysteme mit Zukunft, Bauhaus-Universität Weimar, Germany

[T24] 05.06.2012, *System Investigations of Modern Geodetic Instruments*. Hexagon 2012 Conference, Las Vegas, USA – **invited presentation**

[T23] 24.05.2012, *Ingenieurgeodätische Herausforderungen bei der Überwachung von Bauwerken und Rutschhängen*. OVG (Austrian Society for Surveying and Geoinformation) Colloquium, University of Innsbruck, Austria – **invited presentation**

[T22] 03.11.2011, *The Importance of Engineering Geodesy in the Context of Structural Health Monitoring*. Joint International Symposium on Deformation Monitoring, Hong Kong – **keynote speach**

[T21] 28.10.2011, *EDM-Basismessung mit LSPM-Auswertung*. GKGM Workshop: Hochgenaue Messung langer Strecken, Neubiberg, Germany

[T20] 24.03.2011, *Die moderne Totalstation – ein komplexes Multisensorsystem*. OVG (Austrian Society for Surveying and Geoinformation) Colloquium, TU Vienna, Austria – **invited presentation**

[T19] 01.06.2011, *The impact of image assisted surveying and image based documentation on traditional surveying workflows*. AfricaGEO - Developing Geomatics for Africa, Cape Town, South Africa – **keynote speach**

[T18] 25.11.2010, *Der Einfluss neuer Technologien in Totalstationen auf klassische Vermessungsabläufe*. GEOMATIK-News, Zurich, Switzerland

[T17] 05.10.2010, *Tachymetrie & GNSS – Bildgestützte Vermessung und Dokumentation*. Intergeo 2010, Cologne, Germany

[T16] 25.02.2010, *"Vom Feld ins Internet" – ein Beispiel zur Nutzung internetfähiger Mobilkommunikation bei der Messwerterfassung und Visualisierung von Deformationsmessungen*. 16th International Engineering Surveying Course, Munich, Germany

[T15] 11.02.2009, *Interoperability of GLONASS Observations for RTK Positioning Applications*. 15th International Geodetic Week, Obergurgl, Austria

[T14] 13.11.2008, *New approaches to improve rover positions using standardized RTCM network information based on the Master Auxiliary Concept*. EUPOS-GNSS Symposium 2008, Berlin, Germany

[T13] 30.06.2008, *Applied Laser Physics and Satellite Navigation Technology*. Live demonstration at the 58th Nobel Laureate Meeting (Physics). Lindau, Germany – **invited demonstration**

[T12] 25.04.2008, *A Novel Method of Processing Standardized RTCM Network RTK Information for High-Precision Positioning*. ENC-GNSS 2008, Toulouse, France

[T11] 08.11.2007, *Aktuelle Entwicklungen in der satellitenbasierten Positionierung (GPS/GLONASS/Galileo ...)*. GEOMATIK-News, Zurich, Switzerland

[T10] 26.09.2007, *Neue Strategien des RTK-Processing im SAPOS Einsatz mit RTCM3.1 MAC*. Presentation session for SAPOS RTK network providers, Intergeo 2007, Leipzig, Germany – **invited presentation**

[T9] 26.09.2007, *Aktueller GNSS Status*. Presentation session for SAPOS RTK network providers, Intergeo 2007, Leipzig, Germany – **invited presentation**

[T8] 20.04.2007, *Integrierte Auswertung von inhomogenen Überwachungsdaten am Beispiel einer monolithischen Brücke*. 15th International Engineering Surveying Course, Graz, Austria

[T7] 05.05.2006, *Auswertung von Überwachungsmessungen mit inhomogenen und hybriden Daten*. 9th Austrian Geodetic Day, Krems at the Danube, Austria

[T6] 08.09.2005, *Critical Issues in Using the SOFO Measurement System for Structural Health Monitoring*. SAMCO (Structural Assessment, Monitoring and Control) Summer Academy 2005, Zell am See, Austria

[T5] 16.03.2005, *Potentiale und Probleme beim Einsatz des faseroptischen SOFO Messsystems zur ingenieurgeodätischen Überwachung*. Geo – Colloquium, Austrian Society for Surveying and Geoinformation, Graz, Austria – **invited presentation**

[T4] 22.03.2004, *Temperature Dependence of Gyroscopic Measurements Using the GYROMAT 2000*. Positioning Metrology and Surveying Group (Dr. Michel Mayoud), CERN, Geneva, Switzerland – **invited presentation**

[T3] 17.03.2004, *Monitoring einer Brücke mit geodätischen Methoden und faseroptischen Sensoren*. 14. International Engineering Surveying Course, ETH Zurich, Switzerland

[T2] 27.05.2003, *Monitoring of Bridge Deformations using Embedded Fiber Optical Sensors*. 11th International Symp. on Deformation Measurements, Santorini, Greece

[T1] 24.04.2002, *Positioning by an Active GPS System: Experimental Investigation of the Attainable Accuracy*. FIG XXII Congress, Session TS5.6, Washington, USA

VII. Academic Activities

National and International Bodies

since 01.01.2020	**President** of the ***Austrian Geodetic Commission (ÖGK)***
01.01.2016 - 31.12.2019	**Vice President** of the ***Austrian Geodetic Commission (ÖGK)***
since 01.01.2012	Member of the ***Austrian Geodetic Commission (ÖGK)***

since 01.01.2020	**Vice – Dean** of the Faculty of Mathematics, Physics and Geodesy of ***Graz University of Technology (TUG)***
since 15.12.2020	**Vice President** for West Europe of ***the International Society of Environmental Geotechnology (ISEG***)
since 13.06.2013	Council Member of the ***International Society for Structural Health Monitoring of Intelligent Infrastructure (ISHMII)***
since 01.03.2012	Member of the ***International Society for Structural Health Monitoring of Intelligent Infrastructure (ISHMII)***
since 01.05.2013	Member of the ***Austrian National Committee on Large Dams (ATCOLD)***
since 09.04.2013	Austrian Representative of the ***International Organization for Standardization (ISO) TC172/SC6 "Geodetic and surveying instruments"***
since 12.12.2014	Member of the ***German Geodetic Commission (DGK)***
since 01.01.2013	Member of the ***German Geotechnical Society (DGGT)***
since 10.05.2012	Council Member of the ***Austrian Society for Surveying and Geoinformation (OVG)***
since 27.10.2011	Member of the ***Society for Calibration of Geodetic Devices (SCGD)***

Journals and Examination

since 12.02.2016	Member of the **Editorial Board of the *Journal of Applied Geodesy***
07.12.2012 - 30.04.2015	**Associate Editor of the *Journal of Civil Structural Health Monitoring (JCSHM)***
since 21.08.2012	Member of the ***Editorial Board of the Austrian Journal of Surveying and Geoinformation (VGI)***
since 01.03.2012	Member of the ***Editorial Board of The Monitor***. Associate Editor, responsible for Europe
Journal Reviewer	Journal of Geodesy (JOGE), Journal of Applied Geodesy (JAG), Sensors, Journal of Civil Structural Health Monitoring (JCSHM), Journal of Surveying Engineering (SUENG), Survey Review, Allgemeine Vermessungsnachrichten (AVN), VGI, International Journal of Damage Mechanics (IJDM), Journal of Bridge Engineering (BEENG), Structures and Buildings (SB), Acta Geodaetica et Geophysica (AGGE), Journal of Rock Mechanics and Geotechnical Engineering (JRMGE), Applied Geomatics (AGMJ), IEEE Sensors Letters, Applied Sciences
Supervision of Master theses	Supervisor of more than 20 master theses at Graz University of Technology (Austria)
Examination of PhD theses	Examiner of PhD theses at: Technical University of Munich (Germany), University of Cambridge (UK), Technische Universität Berlin (Germany), Queen's University Belfast (Ireland), University College Dublin (Ireland), Leibniz University Hannover (Germany), Universite de Strasbourg (France), Graz University of Technology (Austria)

Project examiner	Examiner of project proposals for Deutschen Forschungsgemeinschaft (DFG), Swiss National Science Foundation (snf), Canadian Foundation for Innovation (CFI)

VIII. Awards

2021	***Best Paper Award*** at the 10th International Conference on Structural Health Monitoring (SHMII) for the article: *Autonomous Integrity Monitoring of Shotcrete Tunnel Linings using Distributed Fiber Optic Sensing*
2019	***Best Paper Award*** at the 2nd International Conference on Smart Infrastructure and Construction, (ICSIC), Cambridge, UK for the article *Distributed fiber optic sensing on a large tunnel construction site: Increased safety, more efficient construction and basis for condition based maintenance*
2018	***Teaching Award of Excellence 2017/2018*** awarded by the TU Graz for the Lecture: Advanced Engineering Geodesy
2018	***Staatspreis Patent (Federal Patent Award) 2017, Finalist*** with the patent: Tübbingelement mit Dehnungsmessung, AT516158 (B1)
2016	***Best Paper Award*** at the International Conference on Smart Infrastructure and Construction, (ICSIC), Cambridge, UK for the article *Condition monitoring of railway tracks and vehicles using fibre optic sensing techniques*
2015	***Houska Award 2015, Finalist*** with the project: High Sensitive Monitoring of Water Dams in Pump-Storage Operation
2008	***Josef-Krainer-Award 2008*** for the PhD Thesis: Analysis of Inhomogeneous Structural Monitoring Data
2007	***BMW Scientific Award 2007, 5th Place in category PhD thesis*** for the PhD thesis: Analysis of Inhomogeneous Structural Monitoring Data
2007	***Austrian Construction Award*** for the PhD thesis: Analysis of Inhomogeneous Structural Monitoring Data
1998	***Global Surveys Limited Prize*** for the Best Final Year Student at the BEng (Hons) Engineering Surveying course at the Nottingham Trent University

Date: June 2021